



ENVIRONMENTAL MANAGEMENT PLAN

Mixed Use Development: Command Park Ext. 1

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PROJECT DETAILS

Mpumalanga Department of Economic Development, Environment and Tourism (MPDEDET)

Reference No.: 17/2/3 N-135

Project Title: Mixed Use Development: Command Park Ext. 1

Applicant: Poort Inry Teater (Pty) Ltd

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Location: Portion 55 of the farm Naauwpoort 335 J.S., Mpumalanga

Technical Reviewer: Mr. Lourens de Villiers



Approval: Signature



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1 Introduction

This report forms part of an application for environmental authorisation (EIA) for the proposed mixed use development to be known as Command Park Ext. 1, under the National Environmental Management Act, 1998 (Act No. 107 of 1998) as amended by the Environmental Impact Regulations of 18 June 2010.

2 Site documentation

The following documentation must be available at the construction site office at all times:

- A copy of the EIA Report.
- A copy of the Environmental Management Plan (EMP).

2.1 Environmental management plan

The environmental management plan (EMP) should be kept on file in the office. The mitigation measures indicated in this Environmental Management Plan must be implemented by all the site workers and contractors.

2.2 Emergency numbers

Emergency numbers (e.g. developer, police, fire department, ambulance, etc.) must be prominently displayed at the construction site office. Contact details of adjacent landowners or users identified during the basic assessment process should also be kept on file in the office.



2.3 Legislation

2.3.1 Laws of general application

- Constitution of the RSA, 1996 (Act No 108 of 1996)
- National Environmental Management Act, 1998 (Act No 107 of 1998)
- Environment Conservation Act, 1989 (Act No 73 of 1989)
- Promotion of Access to Information Act, 2000 (Act No 2 of 2000)
- Protected Disclosures Act, 2000 (Act No 26 of 2000)

2.3.2 Atmospheric emissions

- Atmospheric Pollution Prevention Act, 1965 (Act No 45 of 1965)
- Include new Air quality Act (Act No 39 of 2004)
- National Building Regulations and Building Standards Act, 1977 (Act No 103 of 1977)
- Environment Conservation Act, 1989 (Act No 73 of 1989) – Noise Control Regulations in terms of Section 25 of the Environment Conservation Act, 1989
- National Environmental Management Act, 1998 (Act No 107 of 1998)

2.3.3 Water Management

- National Water Act, 1998 (Act No 36 of 1998)

2.3.4 Hazardous Chemicals and Substances

- Hazardous Substances Act, 1973 (Act no. 15 of 1973)
- National Road Traffic Act, 1996 (Act no. 83 of 1986) – GN R225 of 17 March 2000 – National Road Traffic Regulations, 2000
- Occupational Health and Safety Act, 1993 (Act No 85 of 1983) – GN 1179 of 25 August 1995 – Regulations for Hazardous Chemical Substances (HCS)



2.3.5 Waste management

- National Environmental Management: Waste Act (NEMWA) No 59, of 2008
- Environment Conservation Act, 1989 (Act No 73 of 1989)
- National Road Traffic Act, 1996 (Act No 93 of 1996) – GN R225 of 17 March 2000 – National Road Traffic Regulations
- Hazardous Substances Act, 1973 (Act No 15 of 1973)
- National Building Regulations and Building Standards Act, 1977 (Act No 103 of 1977)
- Occupational Health and Safety Act, 1993 (Act No 85 of 1993) – GN 1179 of 25 August 1995 – Hazardous Chemical Substance Regulations

2.3.6 Planning of new activities

- Environment Conservation Act, 1989 (Act No 73 of 1989)
- Development Facilitation Act, 1995 (Act No 67 of 1995)
- National Environmental Management Act, 1998 (Act No 107 of 1998)

2.3.7 Biodiversity

- National Environmental Management Biodiversity Act, 2004 (Act No 10 of 2004)
- Conservation of Agricultural Resources Act, 1983 (Act No 43 of 1983)
- National Veld and forest fire Act, 1998 (Act No 101 of 1998)
- Agricultural Pest Act, 1983 (Act No 36 of 1983) – GN R276 of 5 March 2004
- Fencing Act, 1963 (Act No 31 of 1963)
- National Forest and Fire Laws Amendment Act (Act No 12 of 2001)

2.3.8 Land and Soil Management

- National Environmental Management Act, 1998 (Act No 107 of 1998)
- Environment Conservation Act, 1989 (Act No 73 of 1989)

2.3.9 Heritage resources

- National Heritage Resources Act No 25 of 1999 (Act No 25 of 1999)

2.3.10 Protected areas

- National Environmental Management: Protected Areas Act, 2003 (Act No 57 of 2003)

During the course of the development, the developer and contractors must comply with all other relevant legislation including the bylaws of the Local Municipality.



3 Environmental Management Plan

Refer to the tables below for the EMP.

3.1 Biophysical Environment

3.1.1 Geology or geotechnical Aspects

Table 1: Environmental Management Plan – Geology or geotechnical aspects

OBJECTIVES	MITIGATION MEASURES
<p>Construction phase</p> <p>a) Minimise the disturbance of the local geology through effective prevention measures during the construction activities.</p> <p>b) To ensure that the geotechnical features of the site are taken into account in order to prevent any impact on structures to be built.</p>	<p>a) Effective construction practices and planning.</p> <p>b) Working within the design plan.</p>
<p>Operational phase</p>	<p>None.</p>
<p>Decommissioning phase</p> <p>a) Minimise the disturbance of the local geology through effective rehabilitation measures.</p>	<p>a) Replacement and rehabilitation should be progressive during the project and not left until the end.</p> <p>b) Temporary topsoil stockpiles should be seeded, or protected in a manner acceptable to the environmental planner, so as to avoid erosion by rain or wind.</p>



3.1.2 Topography

Table 2: Environmental Management Plan - Topography

OBJECTIVES	MITIGATION MEASURES
<p>Construction phase</p> <p>a) To ensure that the impact on the topography is limited to the time of construction operations.</p> <p>b) To ensure that the rehabilitation is effective in addressing potential topographical impacts.</p>	<p>a) Before any construction takes place the proposed area for construction will be pegged out. All construction activities will be limited to these areas.</p> <p>b) Reduce the need for stockpiling of material e.g. topsoil removed during the construction operations.</p> <p>c) Limit construction infrastructure required for the operations.</p>
<p>Operational phase</p> <p>a) To reduce the impact on the topography of the site, especially in terms of run-off.</p>	<p>a) All operational activities will be limited to the said site.</p> <p>b) Re-vegetated areas are to be monitored and if necessary, soil conservation measures should be implemented to address any soil erosion that may occur.</p> <p>c) The storm water management measures shall be inspected on a regular basis in order to ensure that the structures function properly and are not causing soil erosion.</p> <p>d) If soil erosion is noted, appropriate remediation measures shall be implemented.</p>
<p>Decommissioning phase</p> <p>a) To minimise the disturbance of the local topography during the decommissioning phase.</p>	<p>a) Implementation of effective and sustainable rehabilitation and remediation practices. The disturbed area will be covered with topsoil, sloped and vegetated using appropriate plant species as soon as possible.</p> <p>b) These vegetated areas will be maintained and monitored in order to ensure the recovery of the vegetative cover.</p> <p>c) Alien and invasive vegetation will be eradicated and controlled by manual removal, chemical application and biological control. The regulations in terms of the Conservation of Agricultural Resource Act, 1983 apply.</p>



3.1.3 Soil

Table 3: Environmental Management Plan - Soil

OBJECTIVES	MITIGATION MEASURES
<p>Construction phase</p> <ul style="list-style-type: none"> a) Minimise the pollution of soil through effective prevention measures. b) Ensure effective soil management practices. c) Protection of the quantity of topsoil to be used in rehabilitation. d) Ensure that the construction activities have the least impact on the soil in terms of structure and erosion potential. 	<p>Topsoil Preservation</p> <ul style="list-style-type: none"> a) Before any construction takes place the proposed area for construction will be pegged out. All construction activities will be limited to these areas. b) The topsoil layer (top 150mm) of the areas where construction will take place will be removed. c) Removed topsoil will be retained for future landscaping efforts and hence stockpiled in demarcated areas. d) Topsoil stockpiles shall not exceed 1m in height and 2m in width and shall be protected from wind, erosion and runoff by covering them with a suitable fabric approved by the ECO. <p>Erosion Control</p> <ul style="list-style-type: none"> a) The contractor is to ensure that all reasonable measures are taken to limit erosion and sedimentation from construction activities. Erosion protection measures include cut-off drains and/or berms. b) Cleared indigenous vegetation can be stockpiled for possible re-use in later rehabilitation or landscaping, or as a brush pack for erosion prevention. c) Should construction in areas that have been stripped not commence within a short period of time, the exposed areas shall be re-vegetated or stabilised. Soil stabilising measures could include rotovating in straw bales (at a rate of 1 bale/20m²), applying mulching or brush packing, or creating windbreaks using brush or bales. d) Once the construction activities have been completed, the remaining disturbed area must be covered with topsoil, sloped and re-vegetated as soon as possible using suitable grass species. This re-vegetation will assist in reducing the potential for erosion. If sterilisation of the topsoil during stockpiling has occurred, inorganic fertilizers should be used to supplement the soil before



seeding of the area takes place. Compacted soil should be ripped to ensure effective re-vegetation.

- e) Effective storm water measures will be implemented to minimise soil erosion. (Refer to 3.1.6 Surface water, Table 6, Storm water Control).

Soil pollution prevention

- a) Correct waste management measures (Refer to 3.2 Waste Management, Table 12) are to be implemented for the construction site. No dumping of any kind of waste (general, construction, hazardous waste, etc.) will take place on site.
- b) Proper handling, storage and disposal of hazardous chemicals (Refer to 3.3.2 Handling, Storage and Disposal of Substances and Hazardous Chemicals, Table 14).
- c) Sufficient ablution facilities are to be provided during the construction phase and these facilities are to be maintained (Refer to 3.4.3 Health and wellness of employees and surrounding community, Table 18).
- d) Appropriate management of increased traffic frequency (Refer to 3.3.3 Transportation of goods, Table 15).



<p>Operational phase</p> <ul style="list-style-type: none"> a) Minimise the pollution of the soil through effective prevention measures. b) Ensure effective soil management practices. c) Protection of the quality of the topsoil to be used in rehabilitation. d) Ensure that the operational activities have the least impact on the soils in terms of structure and erosion potential. 	<p>Erosion control</p> <ul style="list-style-type: none"> a) Monitoring and remediation of soil erosion shall be undertaken. Compacted soil should be ripped to ensure rapid vegetation establishment. b) Effective storm water measures shall be implemented to minimise soil erosion (Refer to 3.1.6 Surface water, Table 6, Storm water Control). <p>Soil pollution prevention</p> <ul style="list-style-type: none"> a) Correct waste management measures (Refer to 3.2 Waste Management, Table 12) will be implemented for the site. No dumping of any kind of waste (general, construction, hazardous waste, etc.) will take place on site. b) Proper handling, storage and disposal of hazardous chemicals (Refer to 3.3.2 Handling, Storage and Disposal of Substances and Hazardous Chemicals, Table 14). c) Maintenance of ablution facilities and educating employees on proper hygiene (Refer to 3.4.3 Health and wellness of employees and surrounding community, Table 18). d) Appropriate management of regular traffic frequency (Refer to 3.3.3 Transportation of goods, Table 15).
<p>Decommissioning phase</p> <ul style="list-style-type: none"> a) To ensure soil management practices take place, in order to effectively rehabilitate the site. 	<ul style="list-style-type: none"> a) The site must be monitored for signs of erosion whilst rehabilitation takes place.



3.1.4 Land use and capability

Table 4: Environmental Management Plan - Land use and capability

OBJECTIVES	MITIGATION MEASURES
<p>Construction and operational phase</p> <p>a) To reduce the potential impact of the proposed activity on the surrounding interested and affected parties.</p>	<p>a) Use the development effectively to optimise the land use.</p> <p>b) Before any construction takes place the proposed area for the development will be pegged out. All construction activities will be limited to these areas.</p> <p>c) The requirements of this Environmental Management Plan will be implemented by all the site workers and contractors.</p>
<p>Decommissioning phase</p> <p>a) To rehabilitate to previous agricultural potential.</p>	<p>a) Implementation of effective and sustainable rehabilitation and remediation practices.</p> <p>b) Alien and invasive vegetation will be eradicated and controlled by manual removal, chemical application and biological control. The regulations in terms of the Conservation of Agricultural Resource Act, 1983.</p>



3.1.5 Fauna and flora

Table 5: Environmental Management Plan - Natural vegetation and animal life

OBJECTIVES	MITIGATION MEASURES
<p>Construction phase</p> <ul style="list-style-type: none"> a) Minimise the destruction of natural indigenous vegetation. b) Control of invasive plant species. c) Minimising the destruction of animal habitats in the construction area. d) To prevent or minimise the potential impacts of a fire outbreak on the natural environment. 	<p>Site clearance</p> <ul style="list-style-type: none"> a) Before any construction takes place the proposed area for the development will be pegged out. All construction activities will be limited to these areas in order to reduce the footprint of the proposed activity and minimise impacts on adjacent natural vegetation and animal life. b) Effective planning of the construction operations taking the following into consideration: <ul style="list-style-type: none"> • The site boundary is to be clearly demarcated and screened from the commencement of works. The erection of the final boundary fence or wall is preferable. • The pegged out construction areas should be fenced off or barricaded prior to and during construction. • Significant indigenous trees and landscaped areas to be retained are to be clearly demarcated as “no-go” areas prior to earthworks commencing and are to be protected as such for the duration of the construction phase. • The contractor is to draw up a plan for submission to the ECO and the Facility Manager indicating the locations of construction infrastructure including the site-camp, paint or cement cleaning pits, toilets, stores, site office, and “no-go” areas. c) The minimum standard to fencing of “no-go” areas is 2 strands of wire 500mm apart on droppers of 3m spacing, with danger tape zigzagged between the wires. d) All demarcation is to be regularly maintained. e) All sensitive environments or “no-go” areas are to be demarcated with a wire and danger-tape temporary barrier fence attached to planted posts (wooden or metal) at a minimum.



- f) No unauthorised entry, stockpiling, dumping or storage of equipment in “no-go” areas, or outside the site boundary is permitted.
- g) All construction activities, plant, labour and materials are to be restricted to within the site boundary.
- h) Should the only means of completing specified work be to enter “no-go” areas, authorisation must be provided in writing by the ECO.
- i) All trees and natural features to be retained and protected are to be indicated on the site plan and demarcated. Demarcation is to remain in place for the duration of the work on site.
- j) Search and rescue (if necessary) is to take place prior to commencement of work on site.
- k) Removal of vegetation is to be avoided until such time as soil stripping is required.
- l) Should construction in areas that have been stripped not commence within a short period of time, the exposed areas shall be re-vegetated or stabilised. Soil stabilising measures could include rotovating in straw bales (at a rate of 1 bale/20m²), applying mulching or brush packing, or creating windbreaks using brush or bales.
- m) Once earthworks are complete, disturbed areas are to be re-vegetated or rehabilitated.
- n) All construction workers shall be issued with ID badges and clearly identifiable uniforms.
- o) All construction workers shall be transported to and from site on a daily basis.
- p) Workers shall remain on the site at all times during the work day and no one will be allowed to leave site by foot, not even during break times.



Fire Control

- a) Appropriate equipment to deal with fire is to be readily available on site and maintained (e.g. fire extinguishers).
- b) Basic fire-fighting equipment is to be placed at strategic locations on site (e.g. at the site office, flammable material store and watchmen container).
- c) Equipment is to be maintained in good working order to the satisfaction of local fire authorities.
- d) Stockpiles of vegetation are only to be located in areas approved by the Facility Manager and may not exceed 2m in height. Methods of stacking must take cognizance of the possible creation of a fire hazard.
- e) No burning of stockpiled vegetation is permitted.
- f) Welding, flame cutting and other hot work is only to be undertaken in places where the necessary safety precautions are in place (i.e. not near potential sources of combustion and with a fire extinguisher immediately accessible).
- g) All flammable materials are to be stored in a suitable, lockable storage area.
- h) Combustible materials may not accumulate on the construction site.
- i) No open fires are permitted. A dedicated braai facility may be permitted in an area approved by the ECO, if the site is in close proximity to firefighting equipment. At no time is a braai fire to be left unattended.
- j) Smoking is prohibited near places where any readily combustible or flammable materials are present. Notices are to be prominently displayed prohibiting smoking in such areas.
- k) Cooking is to be restricted to bottled gas facilities in designated areas approved by the ECO. This facility is to be supervised and strictly controlled. Fire extinguishers must be readily available.
- l) Appropriate equipment to deal with fire is to be readily available on site and maintained (e.g. fire extinguishers).
- m) Night watchmen are to be provided with adequate cooking and heating facilities (no open fires), and access to communication equipment.



<p>Operational phase</p> <ul style="list-style-type: none"> a) To control the growth of declared weeds and/or invader plants. b) To prevent or minimise the potential impacts of a fire outbreak on the natural environment. 	<p>Alien and invasive vegetation</p> <ul style="list-style-type: none"> a) Alien and invasive vegetation will be eradicated and controlled by manual removal, chemical application and biological control. The regulations in terms of the Conservation of Agricultural Resource Act, 1983 apply. <p>Fire Control</p> <ul style="list-style-type: none"> a) Appropriate equipment to deal with fire is to be readily available on site and maintained (e.g. fire extinguishers). b) Safety signage including “No Smoking”, “No Naked Lights” and “Danger”, and product identification signs, are to be clearly displayed on fuel stores and tanks. c) Smoking is prohibited near places where any readily combustible or flammable materials are present. Notices are to be prominently displayed prohibiting smoking in such areas. d) Night watchmen are to be provided with adequate cooking and heating facilities (no open fires), and access to communication equipment
<p>Decommissioning phase</p> <ul style="list-style-type: none"> a) To rehabilitate disturbed areas with indigenous species and to control the growth of declared weeds and/or invader plants. 	<ul style="list-style-type: none"> a) Implementation of effective and sustainable rehabilitation and remediation practices. The disturbed area will be covered with topsoil, sloped and vegetated using appropriate plant species as soon as possible. b) These vegetated areas will be maintained and monitored in order to ensure the recovery of the vegetative cover. c) Alien and invasive vegetation will be eradicated and controlled by manual removal, chemical application and biological control. The regulations in terms of the Conservation of Agricultural Resource Act, 1983 apply.



3.1.6 Surface water

Table 6: Environmental Management Plan - Surface water

OBJECTIVES	MITIGATION MEASURES
<p>Construction and operational phases</p> <ul style="list-style-type: none"> a) To reduce the potential impact on surface water run-off. b) To ensure that the surface water run-off quality does not impact on the area and receiving environment. c) To reduce erosion and contamination of surface water by effective storm water control. d) Preventing or minimising the potential pollution of surface water as a result of incorrect waste management. e) Preventing or minimising the potential of surface water pollution as a result of improper handling, storage and disposal of substances and hazardous chemicals. f) Preventing or minimising the potential pollution of surface water as a result of insufficient and poorly maintained ablution facilities. g) Preventing or minimising the potential pollution of surface water as a result of increased traffic frequency. 	<p>Storm water control</p> <ul style="list-style-type: none"> a) Before any construction takes place the proposed area for the development will be pegged out. All construction activities will take place within these areas in order to reduce the footprint of the proposed activity and therefore the potential impact on surface water run-off. b) Storm water management measures will be inspected on a regular basis in order to ensure that the structures are functional and do not cause soil erosion. c) Effective storm water measures will be implemented to minimise soil erosion, such as: <ul style="list-style-type: none"> • The storm water drainage system must be maintained (free-draining) and not contaminated by other waste sources. Storm water must be kept separate from the sewage effluent system. • Storm water must be diverted away from bird holding areas, chemical storage areas and wastewater treatment areas. • Placing of erosion prevention structures or vegetation to reduce water velocity at concentration points within the drainage system. • Placing of culverts underneath road foundation. <p>Prevention of surface water pollution</p> <ul style="list-style-type: none"> a) Correct waste management measures (Refer to 3.2 Waste Management, Table 12) are to be implemented. No dumping of any kind of waste will take place on site. b) Proper handling, storage and disposal of hazardous chemicals (Refer to 3.3.2 Handling, Storage and Disposal of Substances and Hazardous Chemicals, Table 14). c) Sufficient ablution facilities are to be provided and these facilities are to be



	<p>maintained (Refer to 3.4.3 Health and wellness of employees and surrounding community, Table 18).</p> <p>d) Appropriate management of increased traffic frequency (Refer to 3.3.3 Transportation of goods, Table 15).</p>
Decommissioning phase	None.

3.1.7 Groundwater

Table 7: Environmental Management Plan - Groundwater

OBJECTIVES	MITIGATION MEASURES
<p>Construction and operational phase</p> <p>a) Preventing or minimising the potential pollution of groundwater as a result of incorrect waste management.</p> <p>b) Preventing or minimising the potential of groundwater pollution as a result of improper handling, storage and disposal of substances and hazardous chemicals.</p> <p>c) Preventing or minimising the potential pollution of groundwater as a result of insufficient and poorly maintained ablution facilities.</p>	<p>Prevention of groundwater pollution</p> <p>a) Correct waste management measures (Refer to 3.2 Waste Management, Table 12) are to be implemented. No dumping of any kind of waste will take place on site.</p> <p>b) Proper handling, storage and disposal of hazardous chemicals (Refer to 3.3.2 Handling, Storage and Disposal of Substances and Hazardous Chemicals, Table 14).</p> <p>c) Sufficient ablution facilities are to be provided and these facilities are to be maintained (Refer to 3.4.3 Health and wellness of employees and surrounding community, Table 18).</p>
Decommissioning phase	None.

3.1.8 Air Quality

Table 8: Environmental Management Plan - Air quality

OBJECTIVES	MITIGATION MEASURES
Construction phase	Dust Control



<p>a) To ensure that activities to be undertaken during the construction phase have the least possible impact on air quality of the site and immediate surroundings.</p>	<p>a) To reduce the potential for dust generation, the clearance of vegetation should be limited where possible.</p> <p>b) The contractors will be required to take appropriate measures to minimise the generation of dust as a result of their work.</p> <p>c) Dust suppression should be practiced, where possible, especially during windy conditions.</p> <p>d) A water bowser needs to be on site to water down dusty roads on dry windy days.</p> <p>e) Speed bumps or traffic speed signs need to be erected to reduce speeding onsite that could result in the generation of dust.</p> <p>f) Regular maintenance of vehicles to address wear of tires and breaks. Optimal engine combustion will allow for 'cleaner' exhaust emissions.</p> <p>Fire Outbreak</p> <p>a) Appropriate equipment to deal with fire is to be readily available on site and maintained.</p> <p>b) Safety signage including "No Smoking", "No Naked Lights" and "Danger", and product identification signs, are to be clearly displayed on fuel stores and tanks.</p> <p>c) Proper management of activities that may result in a fire, such as;</p> <ul style="list-style-type: none"> • Stockpiling of vegetation (Refer to 3.1.5 Fauna and Flora, Table 5). • Handling, storage and disposal of hazardous chemicals and flammable materials (Refer to 3.3.2 Handling, Storage and Disposal of Substances and Hazardous Chemicals, Table 14). • Hot work activities (Refer to 3.1.5 Fauna and Flora, Table 5, Fire Control). • Smoking and cooking (Refer to 3.1.5 Fauna and Flora, Table 5, Fire Control).
<p>Operational phase</p> <p>a) To minimise the amount of greenhouse gases released during the coal burning process.</p> <p>b) To prevent or minimize ambient air pollution as a result of odour emissions.</p> <p>c) To prevent or minimise the potential impact of air pollution</p>	<p>Greenhouse gas control</p> <p>a) Boilers should use clean fuels free of heavy metals and toxic wastes.</p> <p>b) Combustion equipment and air pollution control equipment should be designed and operated to minimise the production and emission of air pollutants.</p> <p>c) Stacks should be high enough to prevent ground level concentrations of pollutants from reaching undesirable levels.</p>



<p>caused by vehicles and other activities onsite.</p>	<p>Dust control</p> <p>a) Dust suppression should be practiced, where possible, especially during windy conditions:</p> <ul style="list-style-type: none"> • A water bowser needs to be onsite to water down dusty roads on dry windy days. • Speed bumps or traffic speed signs need to be erected to reduce speeding on site which could result in the generation of dust. • Regular maintenance of vehicles to address wear of tires and breaks. Optimal engine combustion will allow for 'cleaner' exhaust emissions. • Roads must be tarred or paved where possible. • Windbreaks should be used near large coal stockpiles. <p>Odour Control</p> <p>a) Airtight bags and bins should be used.</p> <p>b) Good housekeeping should be maintained.</p>
<p>Decommissioning phase</p>	<p>None.</p>



3.1.9 Noise

Table 9: Environmental Management Plan - Noise

OBJECTIVES	MITIGATION MEASURES
<p>Construction phase</p> <p>a) To ensure that the activities to be undertaken during the construction phase have an impact of low significance on the construction personnel and noise levels of the surrounding area.</p>	<p>a) The site workers and contractors will adhere to the requirements of the Occupational Health and Safety Act, 1993 (Act 85 of 1993).</p> <p>b) Regular maintenance of vehicles and equipment.</p> <p>c) All machinery is to be fitted with adequate silencers.</p> <p>d) Working hours should be restricted to daylight hours.</p> <p>e) Working procedures should be structured so as to avoid the unnecessary generation of noise.</p> <p>f) The site workers and contractors must wear the necessary protective gear at all times.</p> <p>g) If work is to be undertaken outside of normal work hours permission must be obtained from the ECO and the facility manager.</p> <p>h) No sound amplification equipment such as sirens, loud hailers or hooters are to be used on site except in emergencies and no amplified music is permitted on site.</p> <p>i) No noisy work is to be conducted over weekends or on religious public holidays.</p>
<p>Operational phase</p> <p>a) To prevent the facility becoming a nuisance to adjacent landowners as a result of the increase in environmental sound levels.</p>	<p>a) Make sure the plant and machinery on site is in proper working condition, fitted with the necessary silencing equipment.</p> <p>b) Make sure that the workers on site stick to the prescribed working hours.</p> <p>c) Maintain a dB reading of less than 50dB at the site boundary.</p> <p>d) Keep equipment in good repair and attend to loose or rattling covers, worn bearings and broken equipment.</p>
<p>Decommissioning phase</p>	<p>None.</p>



3.1.10 Sites of archaeological and cultural interest

Table 10: Environmental Management Plan - Sites of archaeological and cultural interest

OBJECTIVES	MITIGATION MEASURES
Construction phase a) To prevent any impact on archaeological remains that may be excavated during the construction phase.	a) If any archaeological remains are exposed during the construction phase, the construction must be terminated immediately and the South African Heritage Resources Agency (SAHRA) must be contacted. In this regard, the applicant must take note of the requirements in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999).
Operational phase	None.
Decommissioning phase	None.

3.1.11 Aesthetic aspects

Table 11: Environmental Management Plan - Aesthetic aspects

OBJECTIVES	MITIGATION MEASURES
Construction and operational phase a) To limit the potential visual impact as a result of the development on the surrounding interested and affected parties.	Visual: a) All activities must be limited to the said site. b) It is the responsibility of the site workers as well as the contractors to ensure that the site is kept neat and tidy. c) Proper waste management measures should be implemented at the site (Refer to 3.2 Waste Management, Table 12). d) All site workers and contractors must comply with the requirements of the Environmental Management Plan. Odour: a) Proper waste management measures should be implemented at the site (Refer to 3.2 Waste Management, Table 12).
Decommissioning phase	None.



3.2 Waste management

Table 12: Environmental Management Plan - Waste management

OBJECTIVES	MITIGATION MEASURES
<p>Construction phase</p> <p>a) To prevent or minimise the contamination of the natural environment by pollutants from waste generated onsite.</p> <p>b) To prevent or minimise the contamination of the natural environment by pollutants from general and hazardous waste generated onsite.</p>	<p>General Waste</p> <p>a) Waste bins shall be provided for domestic waste (lunch litter) and placed in designated eating areas, and any other areas where deemed necessary to control littering.</p> <p>b) Waste bins should not be allowed to overflow and are to be emptied regularly. No littering is permitted on site.</p> <p>c) Accumulation of large stockpiles of waste is not permitted. Waste is to be removed at regular intervals, with a minimum frequency of once a week.</p> <p>d) All waste is to be disposed of at approved landfill sites. No burning or burying is permitted.</p> <p>e) The contractor shall delegate a specific waste management job description to an individual or team if directed by the ECO.</p> <p>Construction Waste</p> <p>a) Building rubble is to be kept separate from other construction waste. Rubble is to be kept clean of brick ties, plastics, papers and cement bags at all times.</p> <p>b) Rubble stockpiles and waste structures shall be positioned to permit easy access by removal trucks.</p> <p>c) Accumulation of large stockpiles of rubble and waste is not permitted. Waste is to be removed at regular intervals, with a minimum frequency of once a week.</p> <p>d) A construction waste collection structure shall be erected on commencement of construction work within the boundaries of the site. The minimum requirement is as follows:</p> <ul style="list-style-type: none"> • 4 Ready-fence panels (3m x 1.8m) covered with shade cloth or hessian, one panel being movable to provide access. The structure shall have a roof (ready fence panel, or similar) to contain waste materials in windy conditions. The floor shall be lined with DPC plastic to prevent ground contamination from



leachate such as cement powder residue or empty chemical or paint containers.

- Alternatively, waste skips can be used but also need to be covered with shade cloth to ensure the containment of waste.
- e) All waste is to be disposed of at approved landfill sites. No burning or burying is permitted.
- f) The contractor shall delegate a specific waste management job description to an individual or team if directed by the ECO.

Hazardous Waste

- a) Hazardous waste such as oil, diesel, petrol, chemicals, paints and solvents are to be disposed of separately from general waste.
- b) Demarcated waste bins shall be provided for hazardous waste and placed at designated areas.
- c) Hazardous waste shall be disposed of at an approved hazardous waste disposal site. It is to be stored in secondary containers (e.g. secured collection drums) until disposal.
- d) All waste is to be disposed of at approved landfill sites. No burning or burying is permitted.
- e) The contractor shall delegate a specific waste management job description to an individual or team if directed by the ECO.

Wastewater from construction activities

- a) Runoff from the washing out of wall cavities is to be contained against the building by excavations of berms around the foundations.
- b) No washing of vehicles or equipment is permitted on site.
- c) Cleaning of equipment is to take place within designated areas.
- d) A dedicated cleaning area is to be installed to facilitate washing of all cement and painting equipment. The cleaning area could be a plastic lined cleaning pit or dedicated plastic or metal drums, located as close as possible to a water point or within reach of a hose no longer than 10m.
- e) No wastewater may be disposed of on site, onto the soil or into any water body.



<p>Operational phase</p> <p>a) To prevent or minimise the contamination of the natural environment by pollutants from waste generated onsite.</p>	<p>General Waste</p> <p>a) The Service Manager should ensure that waste containers are provided for the collection of general waste at various points on the premises.</p> <p>b) Waste containers should be removed weekly to a dedicated landfill site.</p> <p>c) All containers shall be kept in a clean and hygienic manner.</p> <p>d) These bulk storage containers shall be stored in a manner that prevents the harbouring of pests.</p> <p>e) Registered waste removal companies are contracted to remove bulk storage containers to a registered municipal landfill site.</p> <p>f) Training of staff in proper hygiene.</p>
<p>Decommissioning phase</p>	<p>None.</p>



3.3 Resource management

3.3.1 Water, electricity and material usage

Table 13: Environmental Management Plan - Resource management

OBJECTIVE	MITIGATION MEASURES
<p>Construction phase</p> <p>a) To prevent or minimise the impact of redundant activities and use of material that lead to unnecessary reduction of valuable resources.</p>	<p>a) Proper environmental training and awareness.</p> <p>b) Regular maintenance and inspection of equipment, such as hose pipes, to prevent leaks.</p> <p>c) Regular site inspection by supervisors.</p>
<p>Operational phase</p> <p>a) To prevent or minimise the impact of redundant activities and use of material that lead to unnecessary reduction of valuable resources.</p>	<p>General</p> <p>a) Proper environmental training and awareness.</p> <p>b) Monitoring of resource consumption.</p> <p>c) Regular maintenance and inspection of equipment, such as pipes, pumps and fans.</p> <p>d) Regular site inspection by supervisors.</p> <p>e) Implementation of technologies that can reduce resource consumption.</p> <p>Water</p> <p>a) High-pressure hoses should be used to minimise the amount of water used.</p> <p>b) Contaminated water should be efficiently treated and re-used where possible.</p> <p>c) Clean stormwater must be kept away from areas where it could be contaminated and must be directed to the stormwater drainage system.</p> <p>d) All chemical storage areas must be situated on impermeable concrete floors with bunding capable of containing 110% of any spillage.</p> <p>e) Leaking taps and hose pipes are to be repaired immediately.</p> <p>f) Running water taps and hosepipes are not to be left unattended.</p> <p>g) Unused standpipes are to be buried to prevent damage and resultant water leaks.</p> <p>h) Taps are to be attached to secured supports and used in preference to</p>



	standpipes with no valve mechanism to open and close the water supply. All hose and tap connections are to be fitted with correct and appropriate plumbing fittings.
Decommissioning phase	None.

3.3.2 Handling, storage and disposal of substances and hazardous chemicals

Table 14: Environmental Management Plan - Hazardous chemicals

OBJECTIVES	MITIGATION MEASURES
<p>Construction phase</p> <p>a) To prevent or minimise the potential impacts of construction activities on soil, surface water and/or groundwater.</p>	<p>Hydrocarbons</p> <p>a) Proper handling, storage and disposal of hazardous chemicals. All fuels and flammable materials are to be handled safely, stored safely and clearly labelled.</p> <p>b) Flammable materials are to comply with standard fire safety regulations.</p> <p>c) Drip trays must be used to collect spillages from equipment, vehicles and plant. These should be emptied regularly into secondary containers.</p> <p>d) Fuels and flammable materials are to be handled in a safety conscious manner.</p> <p>e) If refueling on site or from drums, the ground must be protected and proper dispensing equipment is to be used, i.e. hand pumps and funnels. Drums may not be tipped to dispense fuel.</p> <p>f) All fuels and flammable materials are to be stored safely and clearly labeled.</p> <p>g) Safety signage including “No Smoking”, “No Naked Lights” and “Danger”, and product identification signs, are to be clearly displayed on fuel stores and tanks.</p> <p>h) All liquid fuels (petrol and diesel) are to be stored in tanks or containers with lids.</p> <p>i) Fuel and flammable materials are to be kept under lock and key at all times and are to be stored at a central, easily accessible location.</p> <p>j) Storage areas for fuels and flammable materials are to comply with standard fire safety regulations.</p>



	<ul style="list-style-type: none"> k) Adequate fire-fighting equipment shall be available close at hand and no smoking is permitted within the vicinity of storage areas. l) All personnel handling fuels and hazardous materials are to be issued with the appropriate Personal Protective Equipment (PPE). <p>Concrete and cement</p> <ul style="list-style-type: none"> a) No mixing of concrete or cement directly on the ground is permitted. The mixing of concrete will only be done on mortarboards (dugga-boards). b) Ready-mix trucks are not permitted to clean chutes on site. Cleaning into foundations or a dedicated cleaning pit is permitted. c) Bricklayers and plasterers are to minimise any cement spill or runoff in their work area, and are to ensure that the work area is cleaned of all cement spillage at end of each workday. d) Both used and unused cement bags are to be stored in weatherproof containers so as not to be affected by rain or runoff. e) Contaminated soil resulting from concrete or cement spills, including residue produced by the washing of cavities, is to be removed immediately after the spillage has occurred and placed on the appropriate rubble stockpile.
<p>Operational phase</p> <ul style="list-style-type: none"> a) To prevent or minimise the spreading of hazardous chemicals to soil, surface water and ground water bodies. 	<p>Hydrocarbons</p> <ul style="list-style-type: none"> a) Proper handling, storage and disposal of hazardous chemicals in a lockable, well ventilated building. b) Drip trays must be used to collect spillages from equipment, vehicles and plant. These should be emptied regularly into secondary containers. c) If re-fuelling on site or from drums, the ground must be protected and proper dispensing equipment is to be used, i.e. hand pumps and funnels. Drums may not be tipped to dispense fuel. d) All fuels and flammable materials are to be handled safely, stored safely and clearly labelled. e) All liquid fuels (petrol and diesel) are to be stored in tanks or containers with lids. Fuel and flammable materials are to be kept under lock and key at all times and are to be stored at a central, easily accessible location. f) Storage areas for fuels and flammable materials are to comply with standard fire safety regulations.



	<p>g) All personnel handling fuels and hazardous materials are to be issued with the appropriate Personal Protective Equipment (PPE).</p> <p>Other Hazardous Chemicals</p> <p>a) Proper storage of chemicals in a lockable well ventilated building.</p> <p>b) Storage areas for hazardous chemicals are to comply with standard fire safety regulations.</p> <p>c) Limited access to the building.</p> <p>d) Safety signage including “No Smoking”, “No Naked Lights” and “Danger”, and product identification signs, are to be clearly displayed in areas housing chemicals.</p> <p>e) Adequate fire-fighting equipment shall be available close at hand and no smoking is permitted within the vicinity of storage areas.</p> <p>f) Chemicals are to be properly labelled and handled in a safety conscious manner.</p> <p>g) All personnel handling hazardous chemicals and materials are to be issued with the appropriate Personal Protective Equipment (PPE).</p> <p>h) The removal of only the daily-required amount of hazardous chemicals to be used from the building.</p> <p>i) If refueling on site or from drums, the ground must be protected and proper dispensing equipment is to be used, i.e. hand pumps and funnels. Drums may not be tipped to dispense fuel.</p> <p>j) Drip trays must be used during re-fueling and to collect spillages from equipment, vehicles and plant. These should be emptied regularly into secondary containers.</p> <p>k) Bund walls to retain possible spillages.</p> <p>l) Follow the relevant chemical clean – up and mitigation procedures in the event of a hazardous chemical spill.</p>
Decommissioning phase	None.



3.3.3 Transportation of goods

Table 15: Environmental Management Plan - Transport activities and use of equipment

OBJECTIVES	MITIGATION MEASURES
<p>Construction phase</p> <p>a) To prevent or minimise the potential impacts of the construction activities on the natural environment.</p>	<p>Increased traffic frequency - road infrastructure</p> <p>a) Ensure that all construction vehicles using adjoining roads are roadworthy.</p> <p>b) All areas impacted by construction shall be regularly maintained, including roads and pavements.</p> <p>c) All loads are to be securely fastened when being transported and all vehicles are to adhere to the tonnage limitation and acquire a permit as required.</p> <p>d) All speed limits and other traffic regulations on the public roadways must be adhered to.</p> <p>Increase traffic frequency – Hydrocarbon pollution</p> <p>a) Equipment and vehicles are to be repaired immediately upon developing leaks. Drip trays shall be supplied for all repair work undertaken on machinery on site or campsite areas.</p> <p>b) Spill kits for hydrocarbon spills, drip trays for plant or machinery leaks, drums or containers for contaminated water and emptying drip trays for minor hydrocarbon spills.</p> <p>c) Drip trays are to be utilised during daily greasing and re-fuelling of machinery and to catch incidental spills and pollutants.</p> <p>d) Drip trays are to be inspected daily for leaks and effectiveness and emptied when necessary. This is to be closely monitored during rain events to prevent overflow. Oil and diesel spills are considered hazardous - disposal of such contaminants should be done by following the recommended steps.</p> <p>e) Access to fuel and other equipment stores is to be strictly controlled.</p> <p>f) Soil contaminated with hazardous substances, fuel or oil shall be treated as hazardous waste and removed from site.</p> <p>g) All loads are to be securely fastened when being transported and all vehicles are to adhere to the tonnage limitation and acquire a permit as required.</p>
<p>Operational phase</p>	<p>Regular traffic - road infrastructure</p>



<p>a) To prevent or minimise the potential impacts of the transport activities on the natural environment.</p>	<p>a) Ensure that all vehicles using adjoining roads are roadworthy. b) All loads are to be securely fastened when being transported. c) All vehicles are to adhere to the tonnage limitation and acquire a permit as required. d) All speed limits and other traffic regulations on the public roadways must be adhered to.</p> <p>Regular traffic frequency – Hydrocarbon pollution</p> <p>h) Plant and vehicles are to be repaired immediately upon developing leaks. Drip trays shall be supplied for all repair work undertaken on machinery on site. i) Drip trays are to be utilised during daily greasing and re-fuelling of machinery and to catch incidental spills and pollutants. j) Drip trays are to be inspected daily for leaks and effectiveness and emptied when necessary. This is to be closely monitored during rain events to prevent overflow. Oil and diesel spills are considered hazardous - disposal of such contaminants are to be done by following the recommended steps.</p> <ul style="list-style-type: none"> • Spill kits for hydrocarbon spills, drip trays for plant or machinery leaks, drums or containers for contaminated water and emptying drip trays for minor hydrocarbon spills. • Soil contaminated with hazardous substances, fuel or oil shall be treated as hazardous waste and removed from site. <p>k) Access to fuel and other equipment stores is to be strictly controlled.</p>
<p>Decommissioning phase</p>	<p>None.</p>



3.4 Human Environment

3.4.1 Interested and affected parties

Table 16: Environmental Management Plan - Interested and affected parties

OBJECTIVES	MITIGATION MEASURES
<p>Construction and operational phases</p> <ul style="list-style-type: none"> a) To prevent wear of access roads, potential accidents on access roads, potential unpermitted transport of materials and potential loss of materials being transported on the access roads, caused by the increased traffic during construction. b) To ensure that contract workers are not impacted upon in terms of the construction work being performed. c) To ensure good relations with all interested and affected parties by creating open channels of communication to address matters of concern that may arise. d) To ensure environmental compliance as indicated in the Environmental Authorisation issued and reduce potential environmental impacts. 	<p>Compliance</p> <ul style="list-style-type: none"> a) A post-construction inspection must be conducted to ensure that any shortcomings are identified and addressed. b) The contractors and site workers must ensure compliance with the relevant legislation at all times. c) The mitigation measures indicated in this Environmental Management Plan will be implemented by all the site workers and contractors. <p>Communication</p> <ul style="list-style-type: none"> a) Communication between the interested and affected parties and the contractors will be established and maintained. b) In order to provide feedback with regards to complaints received, a complaints register will be kept at the construction site. The complaints register will record the following: date when complaint was received, name of person who reported the complaint and when and how the concern was addressed.
<p>Decommissioning phase</p> <ul style="list-style-type: none"> a) To ensure good relations with all interested and affected parties by creating open channels of communication to address matters of concern that may arise during decommission phase. 	<ul style="list-style-type: none"> a) In order to provide feedback with regards to complaints received, a complaints register will be kept at the construction site. The complaints register will record the following: date when complaint was received, name of person who reported the complaint and when and how concern was addressed.



3.4.2 Environmental awareness and training of employees

Table 17: Environmental Management Plan - Environmental awareness and training

OBJECTIVES	MITIGATION MEASURES
<p>Construction phase and Operational phase</p> <p>a) Uneducated and uninformed choices may result in a variety of wrongful activities that can have potential impacts the surrounding environment.</p> <p>b) Informing employees of their impacts on the environment and how they can prevent or minimise these impacts will lead to sound environmental practices.</p>	<p>a) The Manager and Contractor are to ensure that all employees, including sub-contractors and their employees, are required to attend on-site Environmental Awareness Training prior to commencing work on site.</p> <p>b) Follow-up Environmental Awareness Training may be required from time to time as new subcontractors or crews commence work or for specific activities that may potentially impact the environment, or if work is being undertaken in sensitive environments.</p> <p>c) The Manager and Contractor should maintain accurate records of any training undertaken.</p> <p>d) Training is to cover all aspects of the EMP, procedures to be followed, the sensitivity of the site and importance of adhering to “no-go” areas.</p> <p>e) The ECO shall monitor the contractor’s compliance with the requirement to provide sufficient environmental awareness training to all site staff.</p> <p>f) Environmental signage is to be displayed on the site including – “no smoking”, “fire hazards”, etc.</p> <p>g) Emergency numbers are to be clearly displayed.</p>
<p>Decommissioning phase</p>	<p>None.</p>



3.4.3 Health and wellness of employees and the surrounding community

Table 18: Environmental Management Plan - Health

OBJECTIVES	MITIGATION MEASURES
<p>Construction phase</p> <ul style="list-style-type: none"> a) To ensure the health and safety of employees working onsite. b) To prevent or minimise the contamination of the natural environment by pollutants from poor sanitation onsite and improper handling of condemned material. 	<p>Employee Safety</p> <ul style="list-style-type: none"> a) The required protective clothing and equipment will be supplied to the contractors. b) It will be ensured that operators of specialist equipment are properly trained before any job commences. <p>Employee Hygiene</p> <ul style="list-style-type: none"> a) Sufficient ablution facilities shall be provided – minimum of 1 toilet per 15 workers. b) Plumbed facilities are preferred. Chemical facilities are to be serviced regularly. c) Toilets should have properly closing doors and supplied with toilet paper. d) The location of toilets is to be approved by the ECO prior to site establishment, but shall be located within 100m of any work point. e) Chemical toilets are to be serviced weekly. The Contractor is to ensure that no spillage occurs and that the contents are removed from site according to approved methods. f) Chemical toilets are to be emptied prior to temporary site closure for a period longer than 4 days. g) Night watchmen are to be provided with a suitable method of disposing of wastewater and access to communication equipment. h) Only the use of ablution facilities will be permitted onsite.



<p>Operational phase</p> <p>a) To ensure the health and safety of employees working onsite.</p> <p>b) To prevent or minimise the contamination of the natural environment by pollutants from poor sanitation onsite and improper handling of condemned material.</p>	<p>None.</p>
<p>Decommissioning phase</p>	<p>None.</p>

