

**APPENDIX H:
ENVIRONMENTAL MANAGEMENT PLAN**



Environmental

ENVIRONMENTAL MANAGEMENT PLAN FOR THE PROPOSED JABULANI CBD DEVELOPMENT (LAND PARCELS A – C)

10 MARCH 2009

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TABLE OF CONTENTS

1. INTRODUCTION	1
2. PHASES, ROLES AND RESPONSIBILITIES.....	1
2.1. Phases of the Project.....	1
2.1.1. <i>Planning or Design Phase (DS).....</i>	<i>1</i>
2.1.2. <i>Construction Phase (CO).....</i>	<i>1</i>
2.1.3. <i>Operational Phase (OP).....</i>	<i>1</i>
2.1.4. <i>Decommissioning Phase (DE).....</i>	<i>2</i>
2.2. Roles and Responsibilities	2
2.2.1. <i>Project Manager (PM) (Developer Representative)</i>	<i>2</i>
2.2.2. <i>Resident Architect (RA)</i>	<i>2</i>
2.2.3. <i>Environmental Control Officer (ECO)</i>	<i>2</i>
2.2.4. <i>Auditing / Inspections.....</i>	<i>3</i>
2.2.5. <i>Method Statements.....</i>	<i>3</i>
2.2.6. <i>Record Keeping</i>	<i>3</i>
2.2.7. <i>Resident Engineer (RE).....</i>	<i>4</i>
2.2.8. <i>Consulting Engineers (CEs)</i>	<i>4</i>
3. STANDARDS	4
4. EMP OBJECTIVES	4
5. EMP CONTEXT.....	5
6. LEGISLATION.....	5
7. PROJECT OVERVIEW	5
8. ENVIRONMENTAL MANAGEMENT PLAN.....	8
8.1. Planning and Final Design	8
8.2. Construction Phase	9
8.2.1. <i>Soils.....</i>	<i>9</i>
8.2.2. <i>Waste Management.....</i>	<i>13</i>
8.2.3. <i>Fuel, Fuelling And Maintanance</i>	<i>16</i>
8.2.4. <i>Air Pollution</i>	<i>18</i>
8.2.5. <i>Noise Pollution</i>	<i>19</i>
8.2.6. <i>Safety And Security</i>	<i>20</i>
8.2.7. <i>Health.....</i>	<i>22</i>
8.2.8. <i>Blasting On Site</i>	<i>23</i>
8.2.9. <i>Fauna</i>	<i>24</i>
8.2.10. <i>Flora</i>	<i>29</i>
8.2.11. <i>Stormwater.....</i>	<i>32</i>
8.2.12. <i>Traffic Impact</i>	<i>35</i>
8.2.13. <i>Sensitive Areas.....</i>	<i>36</i>
8.2.14. <i>Services</i>	<i>39</i>
8.2.15. <i>Contractor's Site Camp.....</i>	<i>40</i>

8.2.16.	<i>Environmental Awareness Training</i>	40
8.2.17.	<i>Rehabilitation And Landscapping</i>	41
8.2.18.	<i>Advertising</i>	42
8.2.19.	<i>Penalties</i>	43
8.3.	Operational Phase	43
8.3.1.	<i>Phase One of the Jabulani CBD Development</i>	43
8.4.	Decommissioning Phase	44
8.4.1.	<i>Construction Site Decommissioning</i>	44
8.4.2.	<i>Decommissioning Of The Development</i>	46

LIST OF ABBREVIATIONS AND WORDS

CE	Consulting Engineer
CO	Construction
DE	Demolition
DS	Design
DWAF	The Department of Water Affairs and Forestry – both national office and their various regional offices, which are divided across the country on the basis of water catchment areas.
ECA	Environment Conservation Act (Act 73 of 1989)
ECO	Environmental Control Officer
EIA	An Environmental Impact Assessment as contemplated in Sections 21, 22 and 26 of the Environment Conservation Act and the EIA Regulations under NEMA.
EMI	Environmental Management Inspector – from GDACE
EMP	Environmental Management Plan
FAUNA	All living biological creatures, usually capable of motion, including insects and predominantly of protein-based consistency.
FENCE	A physical barrier in the form of posts and barbed wire or any other concrete construction, (“palisade”- type fencing included), constructed with the purpose of keeping humans and animals within or out of defined boundaries.
FLOOD LINE	The line or mark to which a flood could rise, every 50 (1:50 year flood line), or 100 (1:100 year flood line) years
FLORA	All living plants, grasses, shrubs, trees, etc., usually incapable of easy natural motion and capable of photosynthesis.
GDACE	Gauteng Department Agriculture Conservation & Environment
IEM	Integrated Environmental Management
MPRDA	The Mineral and Petroleum Resources Development (Act 28 of 2002)
NEMA	National Environmental Management Act (Act 107 of 1998)
NHRA	National Heritage Resources Act (Act 25 of 1999)

NWA	National Water Act (Act 36 of 1998)
OP	Operational
PENALTY	A fine against the contractor by the PM as per request from the ECO.
PM	Project Manager
RA	Resident Architect
ROD	Record of Decision or Environmental Authorisation (approval or dismissal of project) as issued by GDACE
SABS	South African Bureau of Standards
SAHRA	South African Heritage Resource Agency
SAMOAC	South African Manual for Outdoor Advertising Control
SPOTFINE	A fine against a labourer by the PM as per request from the ECO.
SWALE	A depression between slopes that provides for drainage
TLB	Tractor, Load & Backhoe
TOPSOIL	The layer of soil covering the earth which- <ol style="list-style-type: none">provides a suitable environment for the germination of seed;allows the penetration of water;is a source of micro-organisms, plant nutrients and in some cases seed; andis not of a depth of more than 0,5 metres or such depth as the Minister may prescribe for a specific prospecting or exploration area or mining area.
VEGETATION	Any and all forms of plants, see also Fauna
WETLAND	A low lying area where the land is saturated with water

1. INTRODUCTION

The purpose of an Environmental Management Plan (EMP) is to guide the planning and design, construction and operational phases of a proposed development. This EMP has been developed in parallel with the planning and design phase, which enables environmental guidelines and criteria to be incorporated into the detailed design. This is done to eliminate or mitigate the various possible risks to the environment and its surrounding inhabitants during the planning and pre-construction phase. And it will subsequently ensure that minimal damage will occur to these areas during the construction and operational phases of the proposed project, based on the mitigation measures identified for inclusion in the EMP as a result of the Basic Assessment environmental process.

2. PHASES, ROLES AND RESPONSIBILITIES

2.1. Phases of the Project

The point of departure for any EMP is to take a pro-active route by addressing and minimising any potentially significant problem before it occurs. In particular this EMP deals with the following phases (referred to under Applicable Phase in Table commencing on Page):

2.1.1. *Planning or Design Phase (DS)*

It is essential that possible problematic situations be eliminated or mitigated during the planning phase, to ensure that contingency plans are prepared for any possible accidental situation that may arise during the construction phase. By having these contingency plans in order before construction starts, it will limit any further potentially detrimental impacts to the environment and its surrounding inhabitants.

2.1.2. *Construction Phase (CO)*

The majority of possible environmental impacts on a site tend to occur during the construction phase, and most of them will have immediate effects (e.g. dust pollution, fuel spillage). It is therefore vital that the site is monitored on a continual basis during this phase, as it would then be possible to identify and correct these impacts as they occur, thus minimising their possible impact.

2.1.3. *Operational Phase (OP)*

By being pro-active during the design and construction phases, potentially harmful impacts that may occur during the operational phase will be minimised or eliminated.

2.1.4. *Decommissioning Phase (DE)*

Thoughtful design, thorough monitoring and strict adherence to the EMP during the construction and operational phases will ensure that the decommissioning phase (if and when applicable) will be done efficiently and with minimal damage to the bio-physical and social environments.

2.2. Roles and Responsibilities

Various role players have a range of responsibilities to perform during the different phases of a project:

2.2.1. *Project Manager (PM) (Developer Representative)*

- The PM will be responsible for overseeing the contract from initiation to completion of construction on the site.
- The PM will appoint a team of contractors, which will be responsible for the construction of the entire project.
- The PM will be responsible for ensuring that the development is implemented according to the requirements as set out in the EMP.
- The PM should ensure that sufficient resources are available to the other role players to efficiently perform their tasks in terms of the EMP.
- The PM must appoint an independent Environmental Control Officer (ECO) to ensure strict adherence to the EMP.

2.2.2. *Resident Architect (RA)*

Only architects approved by the PM will be allowed to work on the project and will oversee the individual contracts between the owners of the entire site or portions thereof and the contractors.

2.2.3. *Environmental Control Officer (ECO)*

The ECO will be appointed at the start of the construction phase and is mandated to do the following:

- Ensure that all contractors/subcontractors/employees are fully aware of their environmental responsibilities. This will take the form of an initial environmental awareness-training program in which the requirements of this document will be explained.
- Any damage to the environment must be repaired as soon as possible after consultation between the ECO, the Consulting Engineer and relevant contractors.
- The ECO shall monitor their actions to ensure that the developer and/or contractor are adhering to all stipulations of the EMP.

- The ECO shall be responsible for monitoring the construction activities throughout the project by means of site visits and meetings. This should be documented as part of the site meeting minutes.
- The ECO must sign off and the PM must certify that all clean-up and rehabilitation, or any remedial action required, are completed prior to transfer of properties.
- A post-construction environmental audit is to be conducted to ensure that all conditions in the EMP have been adhered to.

2.2.4. *Auditing / Inspections*

- The appointed ECO on a regular basis should inspect the site where necessary.
- The PM or the contractor's representative will accompany the ECO on site inspections.
- The contractor will use the formats presented in this EMP to report to the PM in terms of compliance to this document.
- When, in the opinion of the ECO, a construction activity will result in environmental damage, the ECO will issue instructions to the contractor or PM, who will in turn order the contractor, to halt the activity. Spot fines or penalties may be levied for non-compliance.

2.2.5. *Method Statements*

Construction methods statements from the contractor will be required for specific activities in sensitive environments on request of the Authorities or the ECO. All method statements will form part of the EMP documentation and are subject to all terms and conditions contained within the EMP document. For each instance wherein it is requested that the contractor submit a method statement to the satisfaction of ECO, the format should clearly indicate the following:

- What – a brief description of the work to be undertaken;
- How – a detailed description of the process of work, methods and materials;
- Where – a description / sketch map of the locality of work; and
- When – the sequencing (phases) of actions with commencement date and completion date estimates.

The contractor must submit the method statement before any particular construction activity is due to start. Work may not commence until the method statement has been approved by the ECO.

2.2.6. *Record Keeping*

All records related to the implementation of this management plan (e.g. site instruction book, ECO diary, methods statements etc.) must be kept together in an office where it is

safe. Records should be kept for two years and at any time be available for scrutiny by any relevant Authority.

2.2.7. *Resident Engineer (RE)*

A resident engineer acts as a direct, on-site resource for all technical aspects related to the development. He/she is available on the construction site at all times, overseeing all phases of the construction activities. He/she will liaise with the ECO where required to ensure EMP implementation.

2.2.8. *Consulting Engineers (CEs)*

The engineers involved during the planning, design and construction period. They are not available on site at all times, but are part of the specialist team during the final design and construction stages to advise on appropriate environmental management and mitigation.

3. STANDARDS

- The ECO will keep written and photographic records of the site and its surroundings before, after and during construction on the site.
- The contractor will keep records of construction activities, instructions received from the ECO and PM concerning environmental matters.
- The ECO will keep records of cases of non-compliance and remedial actions taken.
- Where no quantitative standards are applicable, visual standards will apply.
- The contractor will rehabilitate the site to a condition acceptable to the ECO, and respond timeously to any complaints and instructions regarding construction activities.

4. EMP OBJECTIVES

This EMP must be used during the pre-construction, construction and operational phases of the proposed project.

The objectives of this plan are to:

- Ensure all environmental safeguards are carried out correctly.
- Manage site activities effectively and coordinate with other players in the project.
- Minimise adverse impacts on the environment.
- Ensure that environmental mitigation measures are in place from the start of the project.

- Minimise disruption to fauna and flora and neighbouring landowners/communities.
- Monitor the project.

5. EMP CONTEXT

This EMP fits into the overall planning process of the project and should be implemented by the developer as soon as the Authorities have approved it. A copy of the EMP should always be available on site. All contractors and sub-contractors are to be familiar with the EMP and its contents.

6. LEGISLATION

The EMP is compiled in order to comply with the following legislative documents:

- National Environment Management Act, 1998 (Act 107 of 1998) (as amended)
- Environment Conservation Act, 1989 (Act 73 of 1989) (as amended)
- National Water Act, 1998 (Act 36 of 1998)
- Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983)
- National Environment Management: Biodiversity Act, 2003 (Act 10 of 2003)
- National Heritage Resources Act (Act 25 of 1999)
- Gauteng Planning and Development Act, 2003 (Act 3 of 2003)
- Gauteng Spatial Development Framework (SDF)
- Nature Conservation Ordinance, 1983 (Ordinance 12 of 1983)
- GDACE Policies and Guidelines: C-Plan (Version 2); GAPA (Version 3); Ridges Policy and Red Data Species Policy
- City of Johannesburg Integrated Development Plan
- City of Johannesburg By-laws

Any other environmental, health and safety legislation must also be complied with.

7. PROJECT OVERVIEW

Jabulani is already a significant node in Soweto, but remains poorly focused and thus the area has been identified as a major lead-investment area for the City of Johannesburg (CoJ) through land owned by the City of Johannesburg Property Company (JPC) in Jabulani. In terms of the CoJ's Densification Strategy, higher density residential development around nodes should be encouraged. Due to the presence nearby of Inhlanzane Station on the Naledi – Johannesburg rail commuter line, as well as the planned Bus Rapid Transit (BRT) route along Koma Road in Jabulani, the node is envisaged as a transportation-based hub to be developed in line with the principles of transport oriented development. Pedestrian linkages will also be encouraged from

Inhlanzane Station through the existing cultural precinct of the Jabulani Amphitheatre to Bolani Road, the new planned retail centre and the existing Jabulani Mall.

The Jabulani node has been identified as a key focus area for Region D of the City of Johannesburg. The aim of the planned project is to enable the development of multifunctional mixed land uses in such a way that they not only benefit the immediate community, but also play a catalytic role in stimulating further economic investment in the area.

The land will be developed by the private sector (led by Inkanyeli Projects) following the submission of bids to the JPC by private sector consortia to develop the land.

The JPC ultimately intends developing approximately 36 ha of the land it owns in the Jabulani area. However, it first wishes to develop the mixed land-use concept on land parcels A – C in the Jabulani CBD, thereby testing market reaction to this project before embarking on the development of the remainder of its land holdings.

The total proposed development area comprises approximately 19, 26 ha in extent whilst the area taken up by developable erven will be restricted to approximately 17, 32 ha. The area lost to roads and access circulation equates to approximately 1,94 ha. It is proposed to subdivide the development area into approximately three (3) individual erven ranging in erf sizes between 3, 6694 ha to approximately 10, 3891 ha.

The land use zoning rights proposed for the development provide for the following:

"Special" for

- Residential;
- Commercial purposes (retail and offices); and
- Open space and supporting infrastructure.

The floor area ratio (FAR) proposed for the development ranges between 1.8 – 1.5. It is proposed to limit the height of buildings to a maximum of six storeys subject to the prior approval of a Site Development Plan by the City Council.

Parking ratios in respect of the proposed land uses include:

- Residential: 1 parking bay per dwelling unit; and
- Commercial: 4 parking bays per 100m² of floor area.

The existing Jabulani Amphitheatre situated on Land Parcel A will be retained. Facilities associated with the Amphitheatre will be upgraded.

The JPC has also planned a new theatre on ground west of the existing Amphitheatre. This is a priority project earmarked for use during the 2010 Soccer World Cup. As a

stand alone project that does not trigger the Environmental Impact Assessment (EIA) Regulations, this development has been confirmed by the Gauteng Department of Agriculture, Conservation and Environment (GDACE) as not requiring environmental authorisation.

8. ENVIRONMENTAL MANAGEMENT PLAN

8.1. PLANNING AND FINAL DESIGN

POSSIBLE IMPACT	MITIGATION MEASURES	APPLICABLE PHASES				RESPONSIBLE PERSON	FREQUENCY	COMPLIANT	
		DS	CO	OP	DE			YES	NO
Energy consumption	Energy efficiency/saving measures should be considered in the final design phase, along with other "Green Building" aspects.	X				PROJECT MANAGER, CONTRACTOR	Once-off		
Visual	The slope of the land shall be used to "soften" the visual impact of the six storey residential apartments and other structures on the surrounding environment.	X				PROJECT MANAGER, CONTRACTOR	Once-off		
Services	The final design of services (roads, water/sewer, stormwater, electricity and waste management) should take cognisance of this EMP and the specialist reports in the BA report.	X	X	X		PROJECT MANAGER, CONTRACTOR	Once-off		

8.2. CONSTRUCTION PHASE

POSSIBLE IMPACT	MITIGATION MEASURES	APPLICABLE PHASES				RESPONSIBLE PERSON	FREQUENCY	COMPLIANT	
		DS	CO	OP	DE			YES	NO
8.2.1. SOILS									
Compaction									
Designated Routes	Designated routes shall be determined for the construction vehicles and designated areas for storage of equipment. These areas shall preferably be already disturbed.	X	X			PROJECT MANAGER, ECO, CONTRACTOR	Once-off		
Compacted areas	All areas that are compacted by machinery shall be ripped prior to them being rehabilitated with topsoil and grass seed.		X			CONTRACTOR	Continuous		
Access points & routes	Clearly mark the site access points and routes on site to be used by construction vehicles, workers and pedestrians. Provide an access map to all contractors whom in turn must provide copies to the construction workers. Instruct all drivers to use demarcated access points and routes.	X	X			PROJECT MANAGER, ECO, CONTRACTOR	Once-off		
Vehicular fences	Fence off areas which are off limits to vehicles.	X	X			ECO, CONTRACTOR	Once-off		
Excavated areas	Mark out the areas to be excavated to ensure that only necessary areas are excavated.	X	X			ECO, CONTRACTOR	Once-off		

Erosion									
Erosion prevention	All surface run-off shall be managed in such a way so as to ensure erosion of soil does not occur. All surfaces that are susceptible to erosion shall be covered with a suitable vegetative cover as soon as construction is completed. Or where stormwater erosion may potentially occur, energy dissipaters such as gravel beds or straw bales must be installed to prevent erosion.	X	X			PROJECT MANAGER, ECO, CONTRACTOR	Continuous		
Surface cladding	All surfaces that are susceptible to erosion, shall be protected either by cladding with biodegradable material or with the top layer of soil being seeded with grass or seeded/planted with a suitable groundcover.	X	X			ECO, CONTRACTOR	Once-off		
Wet areas	No vehicles whatsoever are allowed to move across any wet areas (drainage line), other than those specifically required to for construction purposes. This is to prevent erosion, scouring and compaction.		X			CONTRACTOR	Continuous		
Swales	Erosion caused by construction methods or unusually heavy rainstorms must be prevented and managed by building retention swales and cut-off swales to direct the water to shallow, slow flowing slopes and areas.		X			CONTRACTOR	Continuous		
Downhill areas	Straw bales should be placed and adequately secured on all downhill locations where erosion		X			CONTRACTOR	Continuous		

	may occur to prevent washouts and to retain topsoil on the site. A supply of straw bales or similar material must be kept on site for this purpose.								
Topsoil Management									
Stripping of topsoil	The topsoil layer of all areas to be excavated for the purposes of construction shall be stripped and stockpiled in areas where this material will not be damaged, removed or compacted.	X	X			CONTRACTOR	Once-off		
Storing	In order to minimize erosion and siltation, and disturbance to existing vegetation, it is recommended that stockpiling be done/ equipment be stored in already disturbed/exposed areas.	X	X				Continuous		
Top layer	The top layer ($\pm 150\text{mm}$) of all areas to be excavated for the purpose of construction must be stripped and stockpiled in areas where this material will not be damaged, removed or compacted. This stockpiled material shall be used for the rehabilitation of the site and for landscaping purposes once construction is complete.		X			CONTRACTOR	Once-off		
Grass component	When the stripping of topsoil takes place, the grass component shall be included in the stripped topsoil. The soil will contain a natural grass seed mixture that may assist in the regrowth of grass once the soil is used for back filling and rehabilitation.		X			CONTRACTOR	Once-off		
Infrastructure	During the laying of pipes or infrastructure (on or adjacent to the site) topsoil shall be kept aside to		X			CONTRACTOR	Continuous		

	cover the disturbed areas immediately after such activities are completed. Measures should be taken to ensure that no rocks or any other materials are placed on this top layer.							
Designated areas	Stockpiling will only be carried out in designated places where it will not interfere with the natural drainage paths in the environment.	X	X			ENGINEER, ECO, CONTRACTOR	Continuous	
Flood line areas	No stockpiling shall be allowed below the 1:100 yr flood line/within the transitional zone of drainage lines.	X	X			ECO, CONTRACTOR	Once-off	
Stockpile covering	Cover stockpiles and surrounding downhill sides with a sediment fence to stop material washing away.		X			CONTRACTOR	Continuous	
Runoff prevention	Care must be taken to prevent the runoff of silt from open soil and stockpiles into sensitive areas (eg watercourses).		X			CONTRACTOR	Once-off	
Removal areas	Remove vegetation only in areas designated during the planning stage.	X	X			CONTRACTOR	Continuous	
Stockpile footprint	Strip topsoil at start of works and store in stockpiles no more than 2m high (and 4m ² footprint) in a designated materials storage area.		X			CONTRACTOR	Continuous	
Traversing topsoil	No vehicles should be allowed to traverse the stock piled topsoil.		X			CONTRACTOR	Continuous	

8.2.2. WASTE MANAGEMENT									
Construction waste									
Planning	Plan the site before starting – for access, deliveries, construction areas, wash-down area, waste area, stockpiles, and chemicals storage etc.	X				PROJECT MANAGER, ECO, CONTRACTOR	Once-off		
Storage	Temporary waste storage points on site shall be determined. These storage points shall be accessible by waste removal trucks and these points should not be located in areas highly visible from the properties of the surrounding landowners/tenants. These areas should also preferably be already disturbed. The storage of solid waste on site, until such time that it may be disposed of, must be in the manner acceptable to the Local Authority.	X	X			PROJECT MANAGER, ECO, CONTRACTOR	Once-off		
Waste Plan	Prepare a Waste Management Plan. Coordinate with other contractors on site and nearby businesses for potential reuse or 'waste exchange'. Coordinate with other contractors working on site regarding: site management, timing of works and waste management (recycling and reuse potential).	X				CONSULTANT, ECO, CONTRACTOR	Once-off		
Disposal	Solid waste shall be disposed of in a manner approved by the Local Authority.	X	X			CONTRACTOR	Continuous		

	All solid waste must be removed and transported to a recognised waste disposal site on a regular basis.								
Record keeping	Keep records of waste reuse, recycling and disposal for future reference. Provide information to ECO.		X			CONTRACTOR	Continuous		
Cleaning/clearing	Avoid the cleaning of the site camp or paved surfaces with a hose pipe and soap. All roads should be cleared of any obstruction and should be swept clean with a broom, as to avoid the waste from entering the storm water systems.		X	X		CONTRACTOR	Continuous		
Waste removal	On completion of works, the contractors shall clear away and remove from the site all construction paint, surplus material, foundations, plumbing and other fixtures of every kind. Areas thus cleared shall be graded and scarified to restore the ground as near as possible to its original profile.			X		CONTRACTOR	Once-off		
Household waste									
Storage	Temporary waste storage points on the site should be determined. These storage points should be accessible by waste removal trucks and these points should not be located in ecologically sensitive areas /areas highly visible from the properties of the surrounding landowners/tenants and where the wind direction will carry bad odours across the properties of adjacent landowners.	X	X			PROJECT MANAGER, CONTRACTOR	Once-off		
Disposal	No waste materials shall at any stage be disposed		X			ECO,	Continuous		

	<p>of in the open veld of adjacent properties, where the wind direction will carry bad odours across the properties of adjacent tenants or landowners. The temporary stockpiling of any material that could rot and release unpleasant smells into the air will not be permitted.</p> <p>Burning of waste is not permitted. Spot fines of up to R100 may be administered if the employees are found to be polluting the area in any way.</p>					CONTRACTOR			
Waste Bins	<p>Waste bins with lids shall be provided on site for all waste pertaining to food and drinks. These shall be supplied in close proximity to the area where the workers eat.</p>		X			CONTRACTOR	Continuous		
Removal	<p>The waste bins shall be cleared by a waste truck on a weekly basis.</p>		X			CONTRACTOR	Continuous		
Chemical waste									
Design	<p>Design the site in such a manner that chemical wastes are not located in close proximity to any permitted fire making area. These areas shall be predetermined and located in areas that are already disturbed. These areas shall not be within 100 m from any 1:100 yr flood line or drainage lines. This area should be on a concrete base to avoid any possible seepage into the soil. The storage area should be locked and access controlled. Appropriate signage shall be displayed.</p>	X				PROJECT MANAGER, CONTRACTOR	Once-off		

Contamination	Cover any wastes that are likely to wash away or contaminate stormwater. Build a bund around the waste storage area to stop overflow into the stormwater system.		X			CONTRACTOR	Continuous		
Containers	All used hazardous waste (fuel, lubricants, chemicals, diesel, etc) shall be placed in specifically designed containers and closed-up.		X			CONTRACTOR	Continuous		
Collection	All containers shall be collected on a regular basis by certified chemical removal companies.		X			CONTRACTOR	Continuous		
Disposal	All chemical waste shall be disposed of at a certified waste disposal site and proof of this disposal shall be sent to the contractor and ECO.		X			CONTRACTOR	Continuous		
8.2.3. FUEL, FUELLING AND MAINTANANCE									
Fuel storage									
Storage	No storage of any fuel will be allowed on site, other than what is approved by GDACE or other legislation. Such an area should be sealed off and access controlled. Appropriate signage shall be displayed.	X	X			ENGINEER, CONTRACTOR	Once-off		
Fuelling									
Re-fuelling	Fuelling will be done off-site or in bunded areas on site.	X	X			ENGINEER, CONTRACTOR	Continuous		
Spill kits	Spill kits must be available in all vehicles that transport hydrocarbons for dispensing to other vehicles on the site. The dispensing devices (pump		X			ECO, CONTRACTOR	Continuous		

	heads) must be compatible with the vehicles to which they are dispensing. In addition the dispensing devices must be fitted with the necessary valves/ apparatus that will ensure that the nozzles do not drip fuel after pumping has stopped.								
Decontamination	In the event of spills from vehicles, the area should be cleaned immediately using a bioremediation product, such as Petro-Clean TM. The absorbent and soil must be placed in a bin and removed from the site by a certified company and disposed of as a hazardous waste at a licensed commercial facility.		X			CONTRACTOR	Continuous		
Maintenance									
Design	The vehicle maintenance yard and secured storage area will be established as far as is practicable, outside 1:100 year flood line and buffer area around drainage/stormwater channels. The maintenance yard should be indicated on the layout plan of the site.	X				PROJECT MANAGER, CONTRACTOR	Once-off		
Maintenance area	The maintenance of vehicles and equipment used for any purpose during the development will take place only in the maintenance yard.		X			ENGINEER, ECO, CONTRACTOR	Continuous		
Equipment	Equipment used in the development process must be adequately maintained so that during operations it does not spill oil, diesel, fuel, or hydraulic fluid.		X			ENGINEER, CONTRACTOR	Continuous		

Machinery	Machinery or equipment used on the site must not constitute a pollution hazard in respect of the above substances. The main contractor or ECO shall order such equipment to be repaired or withdrawn from use if he or she considers the equipment or machinery to be polluting and irreparable.		X			ENGINEER, CONTRACTOR	Continuous		
8.2.4. AIR POLLUTION									
Dust control									
Water dampening	The liberation of dust into the surrounding environment shall be effectively controlled by the use of, <i>inter alia</i> , water spraying and/or other dust-allaying agents, such as dust nets. Regular and effective damping down of working areas (especially during dry and windy periods) must be carried out to avoid dust pollution that will have a negative impact on the surrounding environment and committees. When necessary, these working areas should be damped down every 3 - 4 hours.		X			CONTRACTOR	Continuous		
Speed of trucks	The speed of haul trucks and other vehicles must be strictly controlled to avoid dangerous conditions and excessive dust. Preferably trucks should not exceed a speed of 20km/hr.		X			CONTRACTOR	Continuous		
Fire									
Fires on site	A designated area shall be assigned for fire making, if necessary, by the construction workers,	X	X			CONTRACTOR	Once-off		

	so as to ensure that run-away veld fires do not occur. This will also reduce air pollution by excessive smoke.								
Machinery									
Exhaust fumes	Machinery or equipment used on the site must not constitute a pollution hazard in respect of air pollution via excessive exhaust fumes. Such machinery shall be inspected regularly by the contractor and rectified immediately, if necessary.		X			CONTRACTOR	Continuous		
8.2.5. NOISE POLLUTION									
Working hours									
Normal working hours	Construction should be limited to normal working hours, which is stipulated to be from 06h00 to 18h00, Mondays to Fridays and Saturday from 06h00 to 15h00. No work should be allowed on Sundays and Public Holidays, except in extreme emergencies and with the prior approval of the Project Manager and ECO and with notification to the surrounding landowners.	X	X			PROJECT MANAGER, ECO, CONTRACTOR	Continuous		
Staying on site									
Construction workers	Except for 24-hour security guards, no workforce for any of the contractors, nor their family and friends, are allowed to stay on the site.		X			CONTRACTOR	Continuous		
Accommodation	Alternative accommodation shall be arranged for construction workers by the contractors, should	X	X			CONTRACTOR	Continuous		

	they be too far from their permanent residence, and need accommodation closer to the site.								
Noise Regulations	Contactors and site workers must comply with the Provincial noise requirements as outlined in Provincial Notice No. 5479 of 1999: Gauteng Noise Control Regulations. The contractor is required to adhere to SABS 1200 and ISO 9000 safety measures during construction on the entire site.		X			CONTRACTOR	Continuous		
8.2.6. SAFETY AND SECURITY									
Safety									
Informal settlement	No informal settlement will be allowed on the premises or on the access roads leading to the construction site.	X				CONTRACTOR	Continuous		
Informal trading	No casual or informal trading will be allowed at the entrances to the property, or the access roads. It is the responsibility of the contractor to remove any informal traders and discourage the workers from using these informal traders. If the need occurs for vendors, it should be arranged by the PM to have the vendors inside the main contractor work camp.	X				CONTRACTOR	Continuous		
Dangerous areas	All dangerous areas and deep excavations should be barrier taped to ensure visibility of these areas.	X				CONTRACTOR	Continuous		
Sign boards	Clear sign boards should be erected at the entrance to the site to indicate that a construction	X				CONTRACTOR	Continuous		

	site is being entered and that certain safety precautions should be followed (hard hats, boots, etc).								
Fire extinguisher	Fires are restricted to certain areas to ensure safety on site. A fire extinguisher should be accessible at the site camp and the site personnel should receive training in the use of a fire extinguisher.	X	X			CONTRACTOR	Continuous		
Emergency numbers	A list with all the relevant emergency telephone numbers shall be pasted up in the site office (hospital, fire department, police, ambulance, etc.) for easy access in the event of an accident.	X	X			CONTRACTOR	Continuous		
Security									
Security guards	Due to the requirement for security, the construction teams will not be housed on site, and will have to travel to/from site. However, security officers will remain on site for the purposes of guarding the equipment.	X	X			CONTRACTOR	Continuous		
Access control	A system must be implemented where all staff will carry ID. Access control should be enforced. GDACE official should be allowed access to site at any time of the day for inspection purpose.	X	X			CONTRACTOR	Continuous		
Fencing	Fencing is required during the construction phase of the project to demarcate the boundaries of the construction site and work camp. Erection of the fence must occur with minimal impact on the natural environment. The fence will ensure that		X			CONTRACTOR	Once-off		

	access to and from the site will be restricted to staff only.								
Casual access	No casual access to other areas other than the work camp, and the individual construction site will be allowed.		X			CONTRACTOR	Continuous		
Fence rehabilitation	All negative effects caused by the erection of any temporary fences must be rehabilitated after construction is complete.			X		CONTRACTOR	Once-off		
8.2.7. HEALTH									
Chemical toilets									
Number of toilets	One (1) portable chemical toilet for every 10 workers should be provided on site (not all in the contractors camp, but where the workers are working).	X	X			CONTRACTOR	Continuous		
Location	Chemical toilets shall not be in close proximity to any natural drainage channels or wetlands. Chemical toilets shall not be within 100 m of the 1:100 yr flood line. It is important, however, that toilets be placed in areas where the largest number of workers are active on a daily basis.	X	X			ECO, CONTRACTOR	Continuous		
French drains	No French drain systems may be installed.	X				ENGINEER, CONTRACTOR	Continuous		
Usage	No person is allowed to use any other area than chemical toilets.		X			SITE WORKER, CONTRACTOR	Continuous		

Inspections	Regular inspections shall be carried out to ensure that toilets are kept in a hygienic state.		X			CONTRACTOR	Continuous		
Toilet paper	Toilet paper shall be supplied to all toilets.		X			CONTRACTOR	Continuous		
Cleaning	Toilets shall be cleaned by a certified company on a regular basis.		X			CONTRACTOR	Continuous		
Locking	Toilets must be secured to ground so they cannot be overturned, and have a sufficient locking mechanism operational at all times.		X			CONTRACTOR	Continuous		
8.2.8. BLASTING ON SITE									
Magazine area	The ECO, Contractor and Safety Officer will earmark a suitable area on site for a temporary storage magazine for the duration of the construction. This magazine however will only be used to store the daily stock and not for stock to be stored for a long period.	X	X			ECO, SAFETY OFFICER, CONTRACTOR	Once-off		
Blasting times	Blasting will only take place after confirmation between the ECO and Contractor.		X			ECO, CONTRACTOR	Continuous		
Notification	Blasting shall be limited to specific, pre-agreed periods of the day so as to minimize disturbance and shall be agreed with the ECO. The ECO shall be notified in writing 3 days in advance with a two weekly daily schedule when blasting operations will take place and where, so that he/she can notify surrounding residents of each blasting event in		X			ECO, CONTRACTOR	Continuous		

	writing, 24 hours in advance before blasting events will take place								
Safety precautions	Where services run through rocky areas, blasting will be avoided as far as possible – if blasting is required, it should be protected blasting with the necessary Safety precautions of Red flags, a Siren and Safety signs. Where blasting will be near a road, the Metro Police must be notified to control traffic for the duration of blasting operations.		X			ECO, CONTRACTOR	Continuous		
8.2.9. FAUNA									
Regulations	All activities on site must comply with the regulations of the Animal Protection Act, 1962.		X			CONTRACTOR	Continuous		
Sensitive areas	All environmentally sensitive areas must be fenced off before construction commences and indicated as “no-go” areas.	X	X			CONTRACTOR	Continuous		
Snaring/hunting	Snaring and hunting of fauna by construction workers on or adjacent to the study area is strictly prohibited. It should also be a condition of employment that any employees/worker caught poaching will be dismissed.		X			CONTRACTOR	Continuous		
Training	Workers must be trained on how to deal with fauna species as intentional killing will not be tolerated.		X			ECO, CONTRACTOR	Continuous		
Loss of habitat	During the CONSTRUCTION phase, workers must be limited to areas under construction and access to the undeveloped areas must be strictly regulated		X						

	<p>("no-go" areas during construction activities). The entire site should be fenced or cordoned off prior to construction activities. Provision of adequate toilet facilities must be implemented to prevent the possible contamination of ground (borehole) water in the area. All temporary stockpile areas, litter and dumped material and rubble must be removed on completion of construction. All alien invasive plant and tree species should be removed from the site to prevent further invasion. No quad-bikes, motorcycles or off road vehicles and illegal hunting should be permitted. Vegetation clearance should be restricted to the areas under construction allowing remaining animals opportunity to move away from the disturbance. No animals should be intentionally killed or destroyed and poaching and hunting should not be permitted on the site. No hunting with firearms (shotguns, air rifles or pellet guns) or catapults should be permitted on the property as well as neighbouring areas.</p>								
Migratory routes (Fencing)	<p>As the site is fragmented and does not border any open grassland areas, no migratory habitat remains and any fence may be erected.</p>	X	X			ECO, CONTRACTOR	Continuous		

<p>Artificial lighting</p>	<p>During the construction phase, artificial lighting must be restricted to areas under construction and not directed towards the neighbouring areas in order to minimize the potential negative effects of the lights on the natural nocturnal species. Where lighting is required for safety or security reasons, this should be targeted at the areas requiring attention. Yellow sodium lights should be prescribed as they do not attract as many invertebrates (insects) at night and will not disturb the existing wildlife. Sodium lamps require a third less energy than conventional light bulbs.</p>	<p>X</p>	<p>X</p>			<p>ECO, CONTRACTOR</p>	<p>Continuous</p>		
<p>Horticultural activities</p>	<p>Remaining indigenous bulbous geophytes could be retained or replanted wherever possible. Gardens or landscaped areas around the proposed development should be planted with indigenous (preferably using endemic or local species from the area) grasses, forbs, shrubs and trees, which are water wise and require minimal horticultural practices. A species list of suitable species should be compiled for future property owners.</p> <p>A Re-vegetation and Rehabilitation Manual should be prepared for the use of contractors, landscape architects and groundsmen. Where herbicides are</p>		<p>X</p>	<p>X</p>		<p>ECO, CONTRACTOR</p>	<p>Continuous</p>		

	<p>used to clear vegetation, specimen-specific chemicals should be applied to individual plants only. General spraying should be prohibited. All alien vegetation should be eradicated over a five-year period. Invasive species (<i>Eucalyptus sp.</i>, <i>Acacia mearnsii</i>) should be given the highest priority.</p> <p>Where the removal of alien species may leave spoil exposed, alternative indigenous species should be established before eradication takes place. Individual property owners should be encouraged to plant indigenous non-invasive plants. The attention of property owners must be drawn to the most recent Declared Weeds List (2001) in the <i>Conservation of Agricultural Resources Act 43 of 1983</i> and the associated penalties and prohibitions. Horticultural activities such as fertilisers, herbicide and pesticide runoff, increase in alien vegetation and weedy species, and dumping of refuse and building material must be strictly managed, be environmentally sensitive and should meet the following requirements:</p> <ul style="list-style-type: none"> • Limited to building environs and the areas of the proposed development. • Limited irrigation by water-wise gardening 													
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	<p>(use local plants adapted to local conditions).</p> <ul style="list-style-type: none"> • Strict fertiliser, pesticide and herbicide control (limited usage). • Invertebrate pests on the site should be controlled in the following manner: • The least environmentally damaging insecticides must be applied. Pyrethroids and Phenylpyrazoles are preferable to Acetylcholines. Use insecticides that are specific to the pest (species specific) in question. The lowest effective dosages must be applied. The suppliers advice should always be sought. Do not irrigate for 24 hours after applying insecticides in areas where there is a chance of contaminating water-courses or dams-fungal pathogens should be used in preference to chemical insecticides. • Reduction of weed infestation and erosion by minimum tillage gardening practices (groundcovers and mulching better in all respects). • No dumping of any materials in undeveloped open areas and neighbouring properties. Activities in the surrounding 													
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	open undeveloped areas (especially open grasslands and rocky ridge) must be strictly regulated and managed.								
8.2.10. FLORA									
Site inspection	Before any vegetation is removed, a suitably qualified person (i.e. ECO or on his request a vegetation specialist) shall inspect the study area (during the growing season) for any plants/grass/trees species that could be transplanted to other similar/ suitable areas in the study area that will remain natural.	X	X			FLORA SPECIALIST, ECO, CONTRACTOR	Once-off		
Sensitive flora	Any medicinal / sensitive flora that will have to be removed shall be removed by a suitably qualified specialist and relocated.	X				FLORA SPECIALIST, ECO	Once-off		
Fencing	An ecological significance map shall be compiled indicating all sensitive areas. These stipulated areas must be fenced off so there is strictly no unauthorised access, land clearing, construction activities, vehicular traffic of any kind, pedestrian traffic or fires.	X	X			ECO, CONTRACTOR	Continuous		
Flood lines	No clearing of vegetation will be allowed within any 1:100 year flood line or wetland areas.	X	X			ECO, CONTRACTOR	Continuous		
Exotic / invader species	All invader or exotic plant species must be removed from the site and disposed of at a landfill site. The National Department of Agriculture (NDA) can be		X			FLORA SPECIALIST, CONTRACTOR			

	consulted during this process.								
Landscaping	The use of indigenous vegetation should be optimised during the landscaping of the development.			X		FLORA SPECIALIST, LANDSCAPING DESIGNER	Once-off		
Wood harvesting	Wood harvesting of any trees or shrubs in the study area or adjacent areas for firewood shall be prohibited and subject to a fine.		X	X		CONTRACTOR	Continuous		
Retaining flora	On site floral assets and tree clumps shall be identified and retained where possible. Floral assets intended to be retained shall be clearly marked on site and be fenced off.	X	X			FLORA SPECIALIST, ECO, CONTRACTOR	Continuous		
Street trees	No street trees planted by Council may be removed without prior approval.	X	X			FLORA SPECIALIST, CONTRACTOR	Continuous		
Removing flora	No valuable trees or floral assets may be removed without permission from the specialist or in some cases flora removals permit.		X			FLORA SPECIALIST, CONTRACTOR	Continuous		
Erosion and surface runoff	Vegetation plays a critical role in the hydrological cycle by influencing both the quantity and quality of surface run-off. It influences the quantity of run-off by intercepting rainfall, promoting infiltration and thus decreasing run-off. Vegetation can influence water quality in two ways: by binding soils thus protecting the surface layer, and by intercepting surface run-off. When the speed of the run-off is	X	X			FLORA SPECIALIST, ECO, CONTRACTOR	Continuous		

	<p>reduced, suspended particles can settle out and dissolved substances, such as nutrients, can be assimilated by plants. The vegetation has a filtering effect. Storm-water and runoff should be channelled through natural grassland buffer areas or into the artificially created seasonal retention/attenuation ponds reducing the erosional force and the potential risk of further disturbance to any wetland habitats to the east of the site.</p> <p>The timing of clearing activities is of vital importance. Clearing activities and earth scraping should preferably be restricted to the dry season in order to prevent erosion and siltation. The dry months are also the period when the majority of species are either dormant or finished with their breeding activities. Future soil stockpiling areas must follow environmentally sensitive practices and be situated a sufficient distance away from drainage areas. Severely eroded areas should be appropriately re-vegetated. The careful position of soil piles, and runoff control, during all phases of development, and planting of some vegetative cover after completion (indigenous groundcover, grasses etc.) will limit the extent of erosion occurring on the site. Sufficient measures must be</p>								
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	implemented to prevent the possible contamination of surrounding surface and groundwater.								
8.2.11. STORMWATER									
Covering of wastes	Cover any wastes that are likely to wash away or contaminate stormwater.		X			ECO, CONTRACTOR	Continuous		
Bunded area	Build a bund around waste storage areas to prevent overflows into stormwater systems.		X			CONTRACTOR	Once-off		
Natural flow	Natural stormwater must flow freely, either as sheet flow, or where necessary in open grass swales, to allow for infiltration and retention. Natural veld grass must be left undisturbed as far as possible, to allow natural drainage.		X			ENGINEER, CONTRACTOR	Continuous		
Piping of flow	Natural stormwater must not be piped other than in areas where it runs perpendicularly cross a roadway.		X			ENGINEER, CONTRACTOR	Continuous		
Drainage channels	Drainage channels must be constructed along access roads every 50m to divert runoff during construction period.	X	X			ENGINEER, CONTRACTOR	Continuous		
Energy dissipaters	Energy dissipaters (gabions/grass bales etc.) must be installed at all potentially large flow volume areas, especially during the construction phase where large areas will be open soil.		X			ENGINEER, CONTRACTOR	Once-off		

Engineering report	The Engineers service reports will also specifically address stormwater to the satisfaction of the Local Council. This report should be finalised once the development has been approved. The stormwater design for all hard surfaces will ensure that proper management and precautionary measures are taken into account.	X				ENGINEER	Once-off		
Vegetated swales	Where feasible, the use of vegetated swales should be used to accommodate surface runoff, in order to increase infiltration into the soil. The swales should be vegetated with indigenous, vegetation in order to provide habitat for bird life and other species. Where feasible, the swales should be provided adjacent to the property boundaries along the natural gradient.	X	X			ENGINEER, ECO, CONTRACTOR	Continuous		
Retention ponds	Runoff from the development should be retained on site in the open spaces and stormwater detention areas, through the use of detention/retention ponds.		X			ENGINEER, CONTRACTOR	Continuous		
Alkaline soils	Where alkaline soils occur and the design of the development permits, swales should be used to filtrate surface runoff, as this promotes the removal of metals and other contaminants from runoff. Especially runoff from parking areas should be filtered in this fashion before passing into the underground storm water system.	X	X			ENGINEER, CONTRACTOR	Continuous		

Design of swales	<p>The cross-section of the swale should be parabolic or trapezoidal in shape with side slopes no steeper than 1:3, to maximise the wetted channel perimeter. It is recommended that the longitudinal slope not exceed 2% where possible and that a maximum slope of 4% be used. Where a 4% slope must be exceeded, small detention dams should be provided at a minimum interval of 20m.</p> <p>As a rule of thumb the total surface area of the swale must be 1% of the area that drains into the swale. The surface of the swale must be carefully constructed, to avoid compaction, which will inhibit dense vegetation growth and effective runoff infiltration.</p> <p>The installation of vegetated filter strips parallel to the top of stormwater channels can help to treat sheet flows entering the swale.</p>	X				ENGINEER	Once-off		
Maintenance of swale	<p>Maintenance of the swale should include periodic mowing of the grass (never shorter than the design flow depth of the channel). Bare areas should be re-seeded and debris and blockages regularly removed. Sediment depositions should be regularly removed from the swale, to prevent pollution of the runoff from contaminants contained therein.</p>		X			CONTRACTOR	Continuous		
Hydrological Engineer	<p>Please note that the recommendations for the design of the swales are guidelines only and that</p>	X				CONTRACTOR	Once-off		

	the designs of the swales, sedimentation ponds and detention dams should be directed by a hydrological engineer.								
Wetland	Stormwater outflows will not enter directly into any drainage line or wetland.	X				ENGINEER	Continuous		
8.2.12. TRAFFIC IMPACT									
Departmental requirements	All requirements from the provincial and local roads and traffic departments must be adhered to and precautionary measures taken to provide safe and effective traffic management.	X	X	X		ENGINEER	Once-off		
Delivery trucks	Deliveries by large construction vehicles may only take place during weekdays and pre-warning of at least one day prior to delivery must be given to the ECO.		X			CONTRACTOR	Continuous		
Site access	The access of large trucks will be investigated by the PM to provide a suitable access route that does not become a nuisance to existing residents. Only a specified number off trucks at any one time will be allowed onto the property as agreed to between the PM and the ECO based on the capacity of the site to carry vehicles.		X			ENGINEER, CONTRACTOR	Continuous		
Wheel wash	Establish an all-weather site access and wheel wash or shake down and prevent soil and materials being tracked onto the surrounding road system.					CONTRACTOR	Continuous		
Peak traffic hours	Construction vehicles and activities should avoid					CONTRACTOR	Continuous		

	peak hour traffic times (weekdays 7-8am and 5-6pm).								
Legislation	Access roads and traffic planning will adhere to all provincial and local government requirements and laws.					ENGINEER	Once-off		
Established tracks	Access and travelling on the construction site must follow established or demarcated tracks only.					CONTRACTOR	Continuous		
8.2.13. SENSITIVE AREAS									
Rivers/Streams/Wetlands									
Flood line area	No activities may be allowed below the 1:100 year flood line or within 32m from the centre of a stream (on either side), if the 1:100 year flood line can not be established.	X	X			CONTRACTOR	Continuous		
Fencing of flood line area	During construction work that does not intrude on wetland areas/ below the flood line, the drainage feature and the 1:100 yr floodplain must be fenced off. The fence must be erected on a conservation line determined by the ECO and the involved contractors.	X				CONTRACTOR	Once-off		
No dumping	No dumping will be allowed within the 1:100 year flood line area. And no bins shall be located within 50m of the flood line.		X			CONTRACTOR	Continuous		
No toilets	No chemical toilets shall be situated within 50m from the 1:100 year flood line.		X			CONTRACTOR	Continuous		

Surface runoff	All surface runoff shall be managed in such a way as to ensure that erosion of soil does not occur.	X	X			ENGINEER, CONTRACTOR	Continuous		
No vehicles	No vehicles what so ever are allowed to move across wetland or sensitive areas, which could cause erosion scouring and compaction.		X			CONTRACTOR	Continuous		
No stockpiling	No stockpiling shall be allowed below the 1:100 yr flood line/ within the transitional zone.		X			CONTRACTOR	Continuous		
Siltation ponds	Where natural drainage channels join up siltation ponds/stilling basins shall be implemented, if required, in order to allow for the sediments to settle before the water is dispersed downstream.	X	X			ENGINEER, CONTRACTOR	Continuous		
Longitudinal connectivity	No activity is allowed that will impede the longitudinal connectivity of a wetland / stream, as this will hamper its efficiency.	X	X			WETLAND SPECIALIST, CONTRACTOR	Continuous		
No bathing	No bathing will be allowed in any stream / river.		X			CONTRACTOR	Continuous		
No washing	No washing of clothes will be allowed in any stream / river.		X			CONTRACTOR	Continuous		
No taking of water	No taking of water from any stream for drinking or cooking purposes will be allowed, as potable water should be available on site.		X			CONTRACTOR	Continuous		
No urinating	No urinating will be allowed in any stream / river, and this should result in an immediate fine.		X			CONTRACTOR	Continuous		
DWAF licenses	DWAF licenses shall be approved prior to any impeding, diversion, or abstraction of water from a stream / river. No such activities shall be allowed	X				PROJECT MANAGER, CONTRACTOR	Once-off		

	prior to license approval.								
Working below the flood line	When authorisation has been received from DWAF and GDACE allowing work within the 1:100 year flood line, it shall be copied to the ECO and the ECO shall monitor the work below the flood line regularly.		X			CONTRACTOR, ECO	Continuous		
Riparian zone rehabilitation	After activities below the flood line have ceased shall immediately be rehabilitated with appropriate vegetation (a specialist can be consulted).		X			WETLAND SPECIALIST, CONTRACTOR	Continuous		
Hardened surfaces	Hardened surfaces will be located at least 50m outside of the outer boundary of the spruit.	X	X			ARCHITECT	Continuous		
Heritage/Cultural/Archaeological Sites									
Discovery of artefacts	Should any Cultural / Archaeological artefacts be discovered during construction activities, construction shall immediately cease and the National, Cultural and History Museum shall be contacted for investigation. The area must be barrier taped immediately until the ECO can communicate appropriate methods of protection to the Contactors.		X			CONTRACTOR, HERITAGE SPECIALIST, ECO	Continuous		
Fencing	Any archaeological sites present on site shall be fenced and at least 5 metres around it should be safeguarded from development.	X	X			CONTRACTOR	Once-off		
Structures older	No buildings / structures older than 60 years shall	X	X			CONTRACTOR	Continuous		

than 60 years	be damaged / demolished without written authorisation from SAHRA.								
Burial ground	Any burial ground or grave found on site should be reported immediately to the Contractor, ECO and Project Manager. This should be investigated by a specialist and recommendations made.		X			PROJECT MANAGER, CONTRACTOR, ECO	Continuous		
Suspicious artefacts	The ECO will be notified of any suspicious artefacts prior to them being moved or removed.		X			CONTRACTOR			
8.2.14. SERVICES									
Disruption of services									
Informing ECO	If any disruption in services (electricity, water, sewage) is foreseen, the Contractor must inform the ECO at least 4 days prior to these activities, to enable the ECO to inform the surrounding land owners of such possible disruptions.		X			CONTRACTOR	Continuous		
Installation of services									
Requirements	The service systems are to be designed according to the minimum requirements of, and submitted to, the Local Authority for approval. Thus no construction activities must commence on site prior to obtaining the necessary approval.	X	X			ENGINEER, CONTRACTOR	Once-off		
Trenches	Excavate, close and rehabilitate trenches as soon as possible after site services pipes are installed. Avoid open trenches for any extended period of time.		X			CONTRACTOR	Continuous		

8.2.15. CONTRACTOR'S SITE CAMP									
Establishment of site camp	A work site will be established and maintained for storing construction equipment in a non-sensitive area to be agreed upon by the ECO and Contractor.		X			CONTRACTOR, ECO	Continuous		
Fencing	The site camp shall be fenced and all materials shall be stored within this camp.		X			CONTRACTOR	Once-off		
Camp location	The site camp shall not be situated within a natural drainage line or within 50m from a wetland or stream.		X			CONTRACTOR	Once-off		
Rehabilitation of camp	The area where the camp was established must (after the construction period) be rehabilitated according to guidelines in this document.		X			CONTRACTOR	Once-off		
8.2.16. ENVIRONMENTAL AWARENESS TRAINING									
Training program	An environmental awareness training program must be organized as part of the EMP to ensure that each employee knows his/her responsibilities regarding the EMP and the environment in general.	X	X			CONTRACTOR, ECO	Once-off		
Appropriate activities	The employees, construction workers and maintenance crews will receive instruction in the appropriate activities that could take place among the natural resources of the area.		X			ECO	Once-off		

8.2.17. REHABILITATION AND LANDSCAPPING									
Master Plan	A Landscaping Plan should be prepared that stipulates that the existing indigenous vegetation must be retained on site. This plan should be strictly adhered to.	X				LANDSCAPE ARCHITECT	Once-off		
Compacted areas	All compacted areas should be ripped prior to them being rehabilitated.		X			LANDSCAPE ARCHITECT, CONTRACTOR	Continuous		
Reseeding	Stored topsoil and reseeded must be used to rehabilitate all open soil areas after construction.		X			LANDSCAPE ARCHITECT	Once-off		
Time frame	Rehabilitation/ landscaping is to be done immediately after the involved works are completed.		X			LANDSCAPE ARCHITECT	Once-off		
Sub-contractors	Contractor is responsible for the actions and works of the subcontractors and is required to complete the rehabilitation work if the sub-contractor fails to do so. Payment may be withheld from the sub-contractor in the event that the work must be completed by the main Contractor.					CONTRACTOR	Continuous		
Completion of work	On completion of works, the Contractor shall clear away and remove from the site all construction paint, surplus materials, foundations, plumbing and other fixtures, rubbish and temporary works of every kind. Areas thus cleared shall be graded and		X			CONTRACTOR	Once-off		

	scarified to restore the ground to its original profile as near as practicable before topsoil placement.								
Cement mixing	Cement mixing shall be done only at specifically selected sites. After construction activities end any remaining cement shall be crushed and removed from the site. This mixing area shall then be ripped and rehabilitated.		X			CONTRACTOR	Continuous		
Natural features	The natural features of the site should be managed in a holistic manner	X				LANDSCAPE ARCHITECT	Continuous		
Parking bays	Trees can be planted according to the Landscaping Plan.	X				LANDSCAPE ARCHITECT	Continuous		
Trees on lawn/paved area	Trees in lawn and paved areas can be provided with a concrete tree ring of no less than 1m in diameter and can be covered with a grid if such tree is closer than 3m from a pedestrian walkway.	X				LANDSCAPE ARCHITECT	Continuous		
Trees along roads	Trees can be planted at an interval of 15m on both sides of any road longer than 30m to a residential development (unless otherwise indicated by the approved Landscape Development Plan).	X				LANDSCAPE ARCHITECT	Continuous		
8.2.18. ADVERTISING									
Design	A graphic design of any advertisement shall be subject to the approval of the relevant Authorities.	X				ARCHITECT	Once-off		
Requirements	Advertisements should not obstruct the traffic view, movement of pedestrians, cause visual pollution or	X		X		ARCHITECT	Continuous		

	appear to be unsightly. It should be tastefully low key, as defined by the Municipality and will not unrightfully interfere with other existing advertising rights.								
Lease	The lease of the advertising space will be valid for a set period after which the applicant can request for renewal.	X		X		ARCHITECT	Continuous		
8.2.19. PENALTIES									
Payment of penalties	Any person who contravenes any of the provisions of the laws and bylaws will be guilty of an offence and on conviction liable to a fine.	X	X	X		DEVELOPER, ENGINEER, CONTRACTOR, ARCHITECT, ECO	Continuous		

8.3. OPERATIONAL PHASE

8.3.1. PHASE ONE OF THE JABULANI CBD DEVELOPMENT									
Maintenance	All applicable standards, legislation, policies and			X		DEVELOPER	Continuous		

	<p>procedures must be adhered to during operation.</p> <p>Regular inspection of the development must take place to monitor its status.</p>								
Resources	<p>Efforts to reduce consumption of non-renewable resources (energy, water etc) should continue along the recycling of waste.</p>			X		DEVELOPER	Continuous		

8.4. DECOMMISSIONING PHASE

8.4.1. CONSTRUCTION SITE DECOMMISSIONING									
Removal of equipment	<p>All structures comprising the construction camp are to be removed from site.</p> <p>The area that previously housed the construction camp is to be checked for spills of substances such as oil, paint, etc, and these shall be cleaned up.</p> <p>All hardened surfaces within the construction camp area should be ripped, all imported materials removed, and the area shall be top soiled and rehabilitated.</p>				X	DEVELOPER, CONTRACTOR, ECO	Once-off		

<p>Temporary services</p>	<p>The Contractor must arrange the cancellation of all temporary services.</p> <p>Temporary roads must be closed and access across these, blocked.</p> <p>All areas where temporary services were installed are to be rehabilitated to the satisfaction of the ECO.</p>				X		Once-off		
<p>Associated infrastructure</p>	<p>Surfaces are to be checked for waste products from activities such as concreting and these surfaces are to be cleared in a manner approved by the site Engineer.</p> <p>All surfaces hardened due to construction activities are to be ripped and imported materials thereon are to be removed.</p> <p>All rubble is to be removed from the site to an approved disposal site as approved by the ECO. Burying of rubble on site is prohibited.</p> <p>The site is to be cleared of all litter.</p> <p>The Contractor is to check that all watercourses are free from building rubble, spoil materials and waste</p>				X	<p>DEVELOPER, CONTRACTOR, ECO</p>	Once-off		

	<p>materials.</p> <p>Fences, barriers and demarcations associated with the construction phase are to be removed from the site unless stipulated otherwise by the ECO.</p> <p>All residual stockpiles must be removed to spoil or spread on site as directed by the ECO.</p> <p>All leftover building materials must be returned to the depot or removed from the site.</p> <p>The Contractor must repair any damage that the upgrade works has caused to neighbouring properties, specifically, but not limited to, damage caused by poor storm water management.</p>								
8.4.2. DECOMMISSIONING OF THE DEVELOPMENT									
Removal of equipment	<p>All structures comprising the residential, retail, office and other components of the development are to be removed from site.</p> <p>The area that was developed should be checked for spills of substances and these shall be cleaned up.</p> <p>The guidelines mentioned above in the EMP apply</p>				X	DEVELOPER, CONTRACTOR, ECO	Once-off		

	<p>also to the decommissioning phase, where appropriate.</p> <p>All rubble is to be removed from the site to an approved disposal site as approved by the ECO. Burying of rubble on site is prohibited.</p> <p>All other necessary rehabilitation measures must be applied to minimise the environmental impacts and these must be done to the satisfaction of the ECO.</p>								
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