Proposed development of Erf 4603, Despatch, Nelson Mandela Bay Municipality

Draft Environmental Management Programme

Report Prepared for

G5 Properties (Pty) Ltd.

Report Number 501841/2/4

Report Prepared by

srk consulting

July 2017

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Draft Environmental Management Programme (EMPr)

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G5 Properties (Pty) Ltd.

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SRK Project Number 501841

July 2016

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Acronyms

CBA: Critical Biodiversity Area

DEA: Department of Environmental Affairs (National)

DEDEAT: Department of Economic Development, Environmental Affairs and Tourism

EAP: Environmental Assessment Practioner

ECPHRA: Eastern Cape Provincial Heritage Resources Authority

ECO: Environmental Control Officer

EIA: Environmental Impact Assessment

EMF: Electro-Magnetic Field

EMPr: Environmental Management Programme

NEMA: National Environmental Management Act

NMBM: Nelson Mandela Bay Municipality

RP: Representative Person (developer) who is responsible for the implementation of the EMPr.

1 Introduction and Scope of Report

SRK Consulting (SRK) has been appointed by the G5 Properties (Pty) Ltd. to undertake an environmental assessment process for the proposed rezoning and development of Erf 4603 for industrial use. SRK's appointment includes the compilation of this Environmental Management Programme (EMPr). The Erf is situated within the area known as the Jachtvlakte Precinct, an undeveloped Greenfields area located in close proximity to Despatch in the Eastern Cape (refer to Figure 1).

The environmental management measures recorded in this EMPr are based on information supplied to SRK during the compilation of the Basic Assessment Report, including information from the applicant and the recommendations from specialists. This EMPr has been compiled to comply with the specific requirements of the National Environmental Management Act (No. 107 of 1998) (NEMA) Environmental Impact Assessment (EIA) Regulations (2014).

It should be noted that the EMPr is written as if the project has been authorised. This approach in no way presupposes that the project will be authorised, rather, the style of writing is aimed at making the EMPr easier to read and more easily converted into a practical management tool should the application be approved.

SRK has exercised all due care in reviewing the supplied information provided during the course of the environmental assessment process and has included the requirements of commenting authorities. The appropriateness and practicality of the management measures presented in this EMPr has been considered in terms of comments received and discussed with the applicant as necessary. G5 Properties (Pty) Ltd. is fully responsible for the implementation of the EMPr.

The EMPr has been provided to G5 Properties for review, prior to submission, to determine whether the EMPr is implementable and accurate. SRK cannot be held responsible for failure of G5 Properties to comply with the EMPr. The EMPr is by nature a dynamic document and NEMA provides for continual updating of the EMPr, with approval from the Competent Authority.

The aim of this EMPr is to ensure that construction, operation, and maintenance activities are conducted such that potential negative environmental impacts are minimised and positive impacts are enhanced. This EMPr is not a health and safety plan and this EMPr makes no attempt to satisfy the requirements of the Occupational Health and Safety Act.

1.1 Environmental Assessment Practitioner (EAP)

1.1.1 Expertise of EAP

This EMPr was prepared by Karien Killian under the technical guidance of Karissa Nel, and reviewed by Rob Gardiner.

Karien Killian (MSc) is an Environmental Scientist in the SRK Port Elizabeth office. Karien has been involved in Environmental Management for the last three years. Her expertise includes Basic Assessments, Environmental Impact Assessments, Environmental Management Plans, Environmental Compliance Auditing, Waste Licence Applications and Water Use License Applications.

Karissa Nel (MEM, CEAPSA) is a Senior Environmental Scientist, with more than 10 years environmental consulting experience in Environmental Impact Assessments (EIA), Environmental Management Programmes (EMPr), environmental auditing and licensing. Her training is in zoology, microbiology, aquatic ecosystems, wetland assessment and environmental management. Karissa's CV is attached as Appendix A.

Rob Gardiner (MSc, MBA, Pr Sci Nat) is a Principal Environmental Scientist and head of SRK's Environmental Department in Port Elizabeth. He has more than 20 years environmental consulting experience covering a broad range of projects, including Environmental Impact Assessments (EIA), Environmental Management Systems (EMS), Environmental Management Programmes (EMPr), and environmental auditing. His experience in the development, manufacturing, mining and public sectors has been gained in projects within South Africa, Lesotho, Botswana, Angola, Zimbabwe, Suriname and Argentina.

1.1.2 Environmental Assessment Practitioner Details

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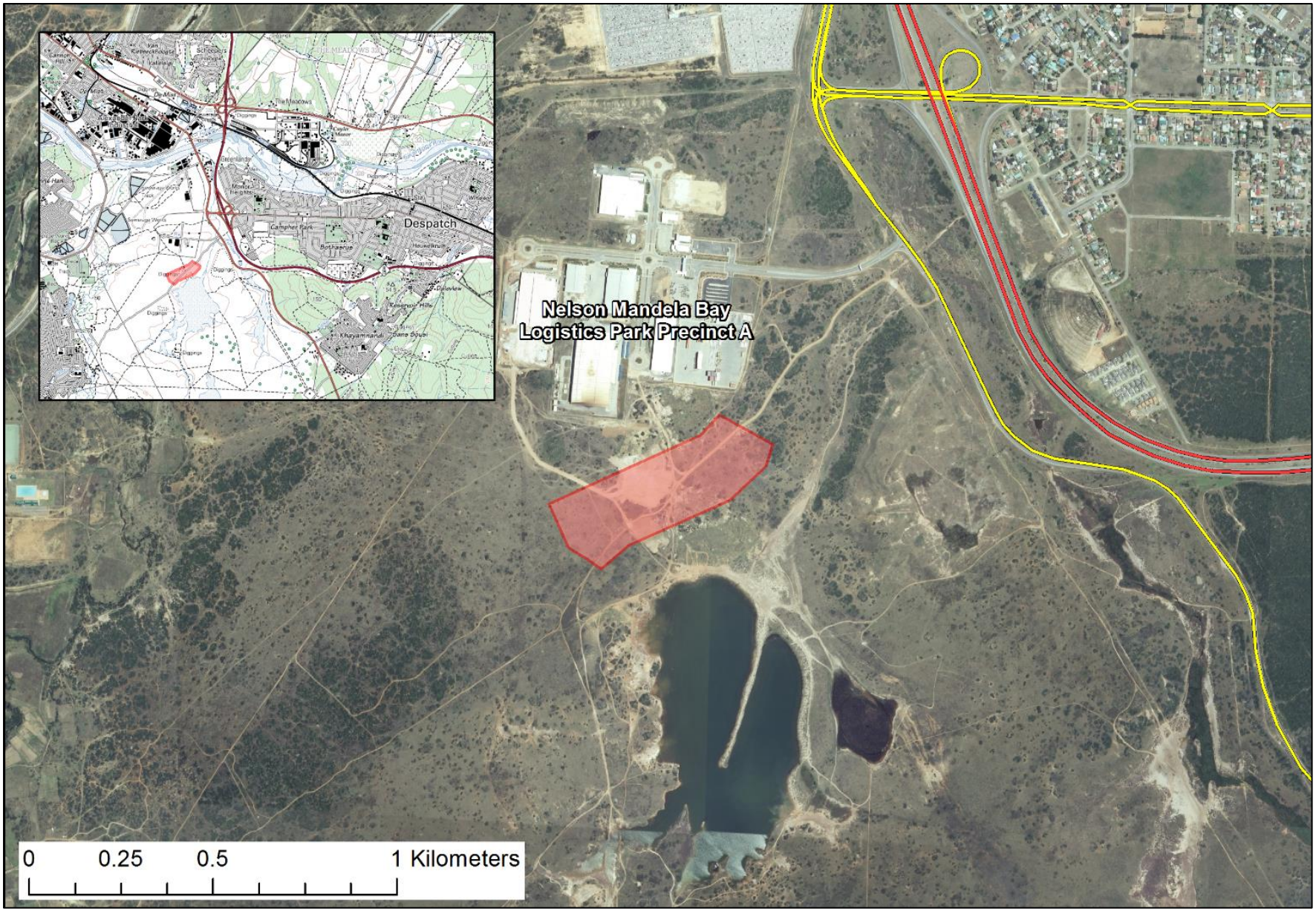

Figure 1: Site locality map for proposed rezoning of Erf 4603

2 Project Description and Environmental Objectives

G5 Properties (Pty) Ltd. proposes to develop Erf 4603 as an Industrial Park. The Erf is situated within the area known as the Jachtvlakte Precinct, an undeveloped Greenfields area located in close proximity to Despatch in the Eastern Cape. The site is situated directly south of the existing Nelson Mandela Bay (Industrial) Logistics Park and extends over an area of approximately 11.26 ha of privately owned land.

The proposed development is in line with the NMBM Spatial Development Framework (SDF) as the site falls within the Uitenhage – Despatch Industrial Node which is classified as a major industrial zone and regarded as a well-established industrial area which still contains pockets of underutilised land and buildings. It is also situated adjacent to Emerging and Activity corridors. Capacity exists for the expansion of the Uitenhage industrial complex at Jachtvlakte and is also integrated into the Jachtvlakte Sustainable Human Settlement planning process.

Erf 4603, Despatch, is currently zoned as Undetermined. An application for rezoning has been submitted to the NMBM for rezoning to Industrial landuse. The primary uses specified under this industrial zoning include industrial buildings, warehouses and public garages. Secondary uses involve business premises, shops, scrap yards, noxious industrial buildings and special buildings. A maximum development coverage of 75% of the site is allowed under this zoning.

A Market Analysis study[1] was conducted for Erf 4603, Despatch, and concluded that a need exists for industrial/ warehousing and distribution facilities with the development prospects being Moderate to High for the site. Based on the outcome of the study, the site will either be developed as an Exclusive Industrial Park or Single Use Industrial Park depending on the interest of prospective tenants. These types of developments do not compete with commercial developments in the area and offer the greatest possible basis for industrial development. A Single Use Industrial Park accommodates only one type of manufacturing or distributive operation and offers the potential of greater possible returns as a result of specialisation. Considering the active South African real estate market, including funds, exploring opportunities in industrial real estate, it is likely that the park will focus on shorter-term industrial leases.

The Industrial Park propose to house facilities for light storage and warehousing (logistic operations) and light assembly/ production facilities to provide a facility conforming with the global trend of locating major automotive suppliers in close proximity to their customers. The park will serve multiple vehicle manufacturers on the basis of 'just-in-time' and 'just-in-sequence'. Additional facilities involve container depots, parking areas, truck parking and public transport facilities to accommodate employees.

The total coverage of the development footprint is 85 290 m² which amounts to 75% of the total site. The Site Development Plan (SDP) is included in Appendix C.

Proposed Services (Refer to latest Services Plan in Appendix C of the Final BAR):

1. Water Supply

The Nelson Mandela Bay Municipality is the water services authority and service provider, and is responsible for the supply of water and sanitation services. The nearest water supply to Erf 4603 is a 315 mm diameter uPVC water main supplied form the Uitenhage water supply system - Scheepers Hoogte Reservoir (Top Water Level (TWL) 100 m). Unfortunately, this supply is currently not adequate and in discussion with municipal officials (Mr D. Turner) no further connections will be allowed form

[1] Note that the Market Analysis study is proprietary information and will be made available to the Department for decision making, but cannot be made available for public scrutiny.

this line as the Nelson Mandela Bay Logistics Park experience major water supply problems. Water supply to this site will have to be from the proposed Jachtvlakte water master plan bulk supply lines.

The Jachtvlakte water master plan proposes a 315 mm bulk water line from the Despatch End Street reservoir. The Top Water Level (TWL) of the End Street Reservoir is 145 m (MSL) which will yield a static head of more than 75 m. This pressure can be reduced by means of a pressure relieve valve (PRV). The connection for Erf 4603 will be from the proposed 3.62 km long 315 mm diameter bulk line. The Jachtvlakte bulk water concept planning is complete; however, development will most likely only take place beyond 2020. Please refer to Section 3.16.3 in the Land Use Application attached as Appendix D.

Should development of the site take place prior to the completion of the Jachtvlakte bulk supply lines, borehole water will have to be used, subject to authorisation or registration by DWS.

With 85 290 m² of coverage, rain water harvesting will be implemented to augment water supply. Rain water harvested will not be used as potable water but for irrigation and industrial use only. mainly be used for irrigation and industrial use and could be used to augment the potable water supply, if required.Sewer

With regards to sewer design, two options can be considered depending on the time of development of Erf 4603 (Section 3.16.4 in the Land Use Application in Appendix D).

a) Sewer Option 1:

This option will link into the existing 315 mm diameter gravity main on the north western boundary of the Nelson Mandela Bay Logistics Park. This option was agreed upon by NMBM Infrastructure and officials (Mr C Bruintjies).

b) Sewer Option 2:

This option will link into the proposed 300 mm diameter Jachtvlakte bulk sewer. The proposed sewer master plan and the subsequent preliminary design of the Jachtvlakte bulk sewers make provision for the drainage of Erf 4603. As previously mentioned, the implementation date of the bulk lines is uncertain at this stage and to construct a portion of the bulk line would not be feasible due to high capital cost of lines and a major pump station.

2. Electricity

There is currently no existing reticulation that can be rerouted for erf application purposes. Bulk electricity supply from Nelson Mandela Bay Municipality of 1.718 MVA can be supplied and require no bulk line augmentation. All cables will be installed underground from the nearest electrical supply point to the site, which is the NMB Logistics Park (Section 3.16.6 in the Land Use Application in Appendix D). The municipality confirmed in writing (refer to Appendix G for confirmation letter by NMBM) that a 1.718 MVA electrical supply can be made available once the final layout, erven unit densities, capacities and exact locations of such supplies are confirmed in writing. The developer will be required to build a substation according to NMBM specification, as well as a supply cable to the proposed connection point, metering equipment and load balancing. Access Road

The property does not currently have direct access to a constructed public road, but currently obtains access to the R368 via an existing gravel road. Although it was intended to retain the current alignment and surface of this road until such time as the surrounding area is developed and the erf can connect into the future road network, the District Roads Engineer has indicated that direct access to the R368 will not be permitted and that access must be onto the existing access to the Logistics Park. Therefore, a new road link can be created to the current dual lane access road to the Logistics Park and should have a maximum servitude width of 10 m. The original informal access road (that crosses a watercourse) shall be closed permanently and rehabilitated to avoid further impacts to the watercourse.

Two alignment options are available.

a) Option 1:

The road will follow the eastern site boundary of the NMB Logistics Park towards the proposed site.

This would be in line with the extension of Stanford Road from Chatty to Botha Road in Despatch, which will traverse the site.

b) Option 2:

This alignment starts similar to Option 1 adjacent to the eastern site boundary of the NMB Logistics Park but then follows an existing track towards the existing gravel access road to the site.

2.1 Environmental Objectives

This section specifies the impact management objectives and outcomes used to determine the extent of management action(s) required to mitigate the impacts identified during the impact assessment process.

2.1.1 Planning and Design

There were no impacts identified for this phase.

2.1.2 Construction phase

Impacts on Ecology

The site is made up of Motherwell Karroid thicket and Sunday's Doringveld thicket, which are both endangered vegetation types. However, the site does not fall within the CBA network of the NMBM Bioregional Plan (2014).

Vegetation clearance, vehicular access and excavation activities required during the construction phase may impact negatively on the biodiversity of the area as well as lead to possible increases in erosion and spread of alien vegetation.

Clearing of vegetation could also result in the loss of potential protected flora and fauna and would result in the area becoming more susceptible to invasive alien plant invasion.

Vegetation in the catchment area for wetlands and other watercourses not only stabilises soils, but also reduces surface water runoff velocities when rainfall occurs. Attenuation of surface water encourages permeation of the soils and reduces surface water runoff. During the construction phase when vegetation is cleared, large quantities of loose earth may easily be washed from the construction zone or be transported down slope during high rainfall events, resulting in increased sedimentation of the watercourses downstream. This could have impacts on aquatic biota and ecosystem functioning.

Noise and habitat destruction resulting from construction activities may displace and disturb local wildlife mainly associated with the watercourse and wetland.

The impact management objective for this impact is:

- Minimise impacts to natural vegetation and thereby reducing potential aquatic sedimentation impacts;
- Prevent potential disturbance to protected flora and fauna; and
- Rehabilitate disturbed areas of the site as soon as possible.
- Minimise wildlife disturbance.

Noise Impacts

Noise from construction activities could have a nuisance impact on nearby receptors such as the Nelson Mandela Bay Logistics Park. The noise disturbance will however be of a temporary nature and will only occur during working hours.

The management objectives for this impact are:

- Minimise noise impacts; and
- Legal compliance with regard to noise generation.

Impacts on Aquatic Resources:

Figure 2 illustrates the aquatic resources surrounding Erf 4603, Despatch.

A wetland exists approximately 100 m downstream south of the site and a drainage line to the east. Construction activities have the potential to impact on the hydrological regime of aquatic habitats. Due to the susceptibility of the soils in the area, this could lead to increased erosion impacting on the functioning of the watercourse and wetland.

During construction various materials, such as sediments, diesel, oils and cement, could pose a threat to the continued functioning downstream areas, if by chance it is dispersed via surface run-off, or are allowed to permeate into the groundwater. Changes to water quality can negatively impact on the functioning of plants and other instream biota.

The impact management objective for this impact is:

- Minimise impacts to watercourses and downstream wetland;
- Minimise potential for increased erosion; and
- Minimise impacts on aquatic ecosystems and biota.

Impacts on Archaeological Resources:

Although the proposed activities are located in an area of low archaeological cultural sensitivity, it is possible that archaeological heritage material exists below the surface and could be impacted during construction (particularly during vegetation removal).

The impact management objective for this impact is:

- Preservation of archaeological resources (by ensuring the appointment of an archaeologist before commencement of construction works).

Impacts on Palaeontological Resources:

The site is of low paleontological significance and most of the sedimentary rocks underlying the study area to the south of Despatch are at most sparsely fossiliferous. However, historical records of large dinosaur bones in a brick quarry at Despatch indicate that significant, albeit rare, fossil remains may be exposed during future developments in this area. It is therefore possible that palaeontological heritage material exists below the surface and could be impacted during construction.

The impact management objective for this impact is:

- Preservation of palaeontological resources.

Impacts on Air Quality:

Dust and exhaust emissions resulting from construction activities (removal of vegetation, earthworks, increased vehicular traffic, topsoil stockpiles, etc.) is expected to have a nuisance impact on nearby road users and the neighbouring Nelson Mandela Bay Logistics Park during construction. According to CDC, existing investors in Precinct A of the NMBLP, particularly those involved in the automotive

business, with showrooms, are sensitive receptors to airborne emissions. Note that this impact will be temporary during the construction phase.

The impact management objective for this impact is:

- Minimise air pollution and dust.

Waste Management:

General construction waste will be generated during the construction period. Lack of proper management of the waste on the site may lead to dumping and wind-blown litter creating a negative visual impact as well as impacting on the surrounding natural ecosystems and aquatic habitats.

The impact management objective for this impact is:

- Prevent pollution of watercourses and surrounding habitat; and
- Legally compliant management of solid waste.

Impacts on Traffic:

Traffic congestion could possibly occur around the entrance to the Logistics Park as well as the surrounding road network as a result of construction vehicles moving onto and from the site during construction.

The impact management objective for this impact is:

- Minimise traffic congestion

Socio-Economic Impacts:

The proposed powerline may generate temporary employment opportunities (e.g. the use of local labourers) for the local labour force. Indirect job opportunities (industries that provide construction materials and services for the project) is also expected as a result of the construction of the proposed development.

The impact management objective for this impact is:

- Maximise employment of local labour; and
- Maximise skills transfer.

2.1.3 Rehabilitation

Rehabilitation should commence immediately after construction in the relevant areas using topsoil stripped before construction. Rehabilitated areas should be monitored and measures must be implemented to ensure that topsoil does not wash away. If erosion and/or sedimentation of downstream areas occur, appropriate measures must be implemented to prevent further erosion and to trap any excessive sediments generated during and after construction.

2.1.4 Operational phase

Aquatic Impacts and stormwater

There is a risk of downstream erosion, contamination and sedimentation if undeveloped cleared areas were not properly rehabilitated during and after the construction phase. Furthermore, an increase in the extent of hardened surface from development that will increase the impermeable surface area and lead to reduced ground absorption of stormwater and increased surface water runoff. This will result in an increase in the quantity and velocity of stormwater leaving the site and could result in soil erosion and downstream sedimentation impacts if stormwater is not appropriately managed. Runoff also has the potential to transport potential contaminants (generated from new potential development

contamination point sources) away from the site into downstream natural environments and water resources.

Due to the close proximity of a wetland downstream of the site and other nearby watercourses, increased runoff could impact the hydrology of the wetland as well as the water quality if stormwater is not appropriately managed on site.

The management objectives for this impact are:

- Stormwater management measures to be in place in order to:
    - Minimise impacts to watercourses and downstream wetland;
    - Minimise potential for increased erosion; and
    - Minimise impacts on aquatic ecosystems and biota.

Socio-Economic Impacts

A number of permanent job opportunities will be generated when the industrial area is operational. In additional, industrial development would contribute to the growth of the local economy in the area.

The management objectives for this impact are:

- Maximise employment of local labour.

2.1.5 Closure phase

Not applicable to this project.

3 Impact Management

This section specifies the impact management outcomes and impact management actions required for the aspects and potential impacts related to the proposed activities. The manner in which the impact management objectives and outcomes, identified above, will be achieved. Where applicable actions will include activities to:

(i) avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;
(ii) comply with any prescribed environmental management standards or practices;
(iii) comply with any applicable provisions of the Act regarding closure, where applicable; and
(iv) comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable

The above are detailed in Table 1 and Table 2 for the construction and operational phases respectively.

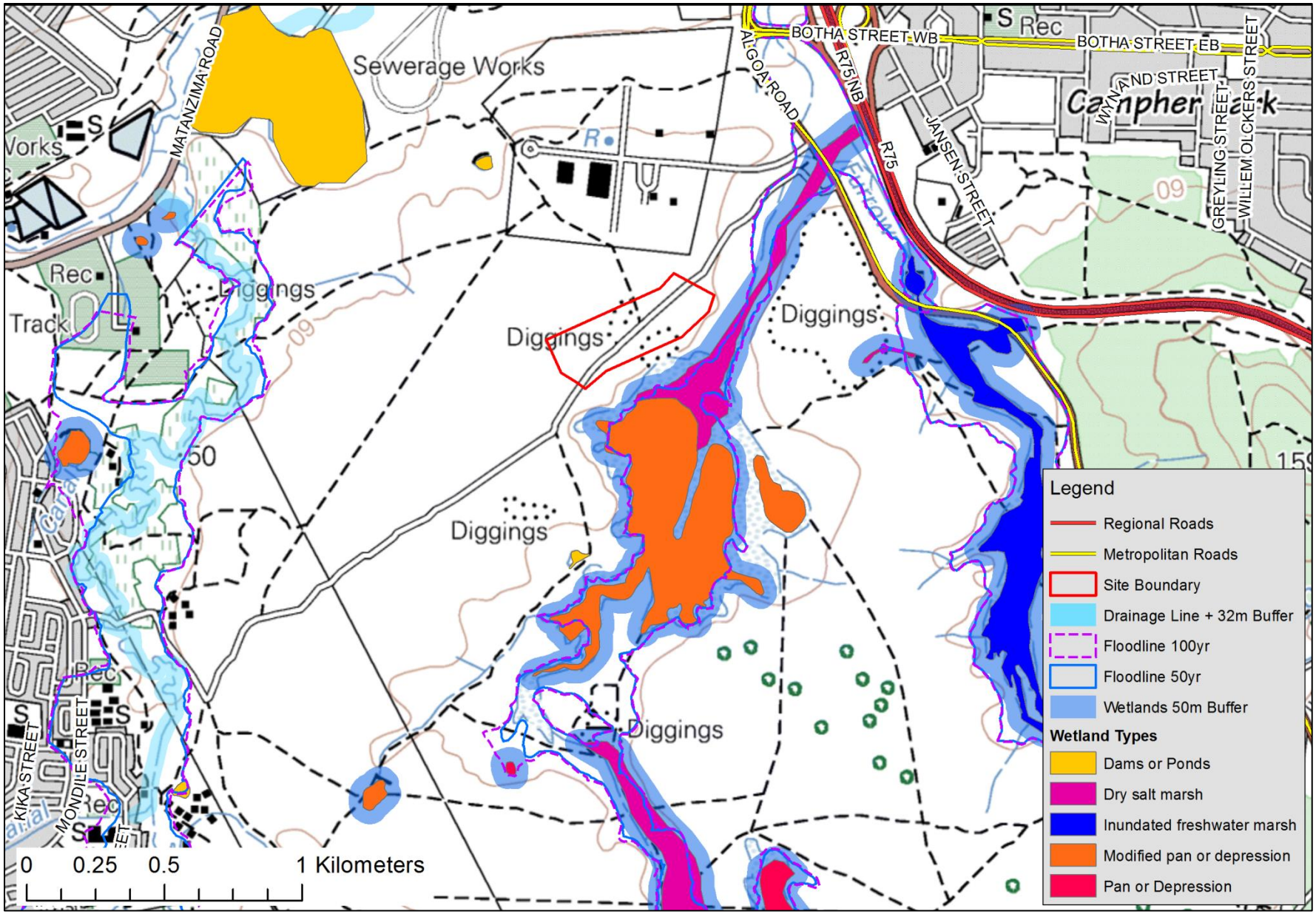

Figure 2: Aquatic systems surrounding the proposed Erf 4603

Table 1: Mitigation and management measures for the construction phase

Environmental Aspect	Potential Environmental Impact	Recommended Mitigation measures		
		Management and mitigation measure	**Time-frame**	**Responsibility**
Setting up the Construction Site Camp		• Should a construction site camp be required, it should be located at least 50 m away from the wetland, drainage line or any potential water resource. The same applies to chemical toilets or any septic tank systems should these be used.	Duration of construction	Contractor and ECO
Clearing of vegetation for construction works.	Impacts on fauna and flora, potential increased erosion and sedimentation of aquatic systems, spread of invasive alien vegetation and dust impacts may be promoted through the disturbance to land.	• Clearing of vegetation should be kept to a minimum, keeping the width and length of the earth works to a minimum; • The development footprint should be clearly demarcated prior to construction and not construction activities should be allowed outside the demarcated area; • The position of the construction site camp should be chosen in consultation with the ECO and should preferably be on an already disturbed area and within the development footprint; • Permits to remove protected plant species should be obtained from the Department of Economic Development, Environmental Affairs and Tourism; • Ensure invasive alien plants are removed and appropriately disposed of regularly until the end of the liability period; • It is recommended that clearing and construction activities during the construction phase be monitored by an ECO at least twice a month; • Walk through the site ahead of clearing to remove any small fauna that may be unable to escape (e.g. tortoises) and place these safely in adjacent undisturbed areas. If necessary, a professional should be contracted (e.g. for removal and relocation of snakes); • Clear vegetation in a phased manner to allow fauna to move off-site (if any) (i.e. the entire area to be developed should not be cleared all at once); • Disturbed areas should be rehabilitated immediately after construction in the relevant area (with indigenous vegetation or using topsoil); • Rehabilitated areas should be monitored well and measures must be implemented to ensure that topsoil does not wash away; • Any erosion gullies/ channels created during six month liability period should be filled immediately to ensure silt does not drain into the wetland or other downstream watercourses; • Dust suppression techniques, such as wetting or covering potential dust sources, should be implemented to minimise the dust impact. The regular application of water or a biodegradable soil stabilisation agent can be used; • In open areas that are exposed to wind, wind screens should be used to reduce wind and also dust at the site and specifically to prevent dust blowing in the direction of the Logistics Park	Duration of construction and defects liability period	Contractor and ECO

Environmental Aspect	Potential Environmental Impact	Recommended Mitigation measures		
		Management and mitigation measure	**Time-frame**	**Responsibility**
		• Rehabilitation, using topsoil, must start as soon as possible after construction is complete in a particular area; • Vegetation regrowth should be monitored for at least six months (liability period) after vegetation clearing or construction in a particular area; • If construction of civil structures and services does not commence within two months of vegetation clearing it is recommended that rehabilitation of the cleared land commence; and • The use of the site for 4x4 and other off-road vehicles should be prohibited and access roads for these activities closed in order to mitigate the ongoing sedimentation impacts of the wetland as a result of these activities.		
Vegetation clearing and excavation activities	Damage or destruction of palaeontological or archaeological resources as well existing service infrastructure and/ or private property.	• All workers on site should be informed of the types of paleontological resources that may be found and the correct procedure to follow should any paleontological resources be found; • Should fossil remains be discovered during construction, these should be safeguarded (preferably in situ) and the environmental control officer (ECO) should alert the Eastern Cape Provincial Heritage Resources Authority (ECPHRA. Contact details: Mr Sello Mokhanya, 74 Alexander Road, King Williams Town 5600; Email: smokhanya@ecphra.org.zaso) so that appropriate mitigation (e.g. recording, sampling or collection) can be taken by a professional palaeontologist; • Disturbance of any large mammal bones within the sandy surface deposits should immediately be reported to a qualified palaeontologist/ ECPHRA, work stopped and the area barricaded until the palaeontologist can get to site; • Calcareous material excavated during the project should be regularly inspected by the ECO or site manager and should marine invertebrates (sea shells) or other fossils be seen a qualified palaeontologist should be contacted to take samples thereof; • If concentrations of archaeological heritage material and human remains are uncovered during construction, all work must cease immediately and be reported to the Albany Museum (046 622 2312) and/or the South African Heritage Resources Agency (SAHRA) (021 642 4502) so that systematic and professional investigation/ excavation can be undertaken; and • Construction managers/foremen should be informed before construction starts on the possible types of heritage sites and cultural material they may encounter and the procedures to follow when they find sites.	Duration of construction	Contractor and ECO
Construction and domestic waste generated during construction	Lack of proper management of the waste on the site may lead to wind-blown litter and contamination resulting from waste and rubble, creating a negative visual impact and	• All waste generated on site shall be collected in waste receptacles fitted with lids and appropriately and regularly disposed of at a registered municipal landfill site; • • Where possible, recycling of waste should be encouraged by providing clearly marked bins for recyclable materials (i.e. glass, paper, etc.); • No on-site burning, burying or dumping of any waste materials, litter or refuse shall occur;	Duration of construction	Contractor

Environmental Aspect	Potential Environmental Impact	Recommended Mitigation measures		
		Management and mitigation measure	**Time-frame**	**Responsibility**
	impacting on aquatic ecosystems.	• Weekly litter inspections should be conducted and general housekeeping maintained; • Hazardous waste (if applicable) should be disposed of at a registered hazardous landfill facility and proof of correct disposal should be obtained; • Records of disposal of all waste generated on site shall be maintained for auditing purposes; • Cleared alien vegetation should be disposed of so that it does not re-establish on site; • Chemical toilets must be provided for workers (at a ratio of at least 1 toilet per 20 workers) and these must be regularly serviced (and proof of correct sewage disposal maintained for auditing purposes. Service certificates must be filed by the contractor for inclusion in the audit reports.		
Use of construction vehicles and equipment	Construction vehicles and plant will result in noise impacts	• Construction activities should be kept to normal working hours according to the relevant NMBM Noise Control By-Law and the Noise Control Regulations in terms of the Environmental Conservation Act (Act 73 of 1989) to reduce the noise impact to an acceptable level; • 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 to be permitted on site; • Equipment that is fitted with noise reduction facilities (e.g. side flaps, silencers, etc.) must be used as per operating instructions; • Maintenance of plant and machinery to be undertaken on a regular basis; and • Surrounding landowners or occupiers of land should be informed before activities with extremely high noise levels (e.g. blasting) start.	Duration of construction	Contractor
Storage and handling of environmentally hazardous materials	Leaks and spills of environmentally hazardous materials (e.g. cement, oils and fuels) has the potential to impact on surface and/ or groundwater resources if not correctly managed.	• No storage or maintenance of machinery within 50 m of a watercourse or within the 1:100 year floodline; • Washing of mechanical plant must be conducted off site. No wash water from washing of mechanical plant or equipment to be discharged to any water course; • Any cement batching activities should not be allowed within 50 m of a watercourse. Cement products/ wash may not be disposed of into the natural environment; • Drip-trays must be provided beneath standing vehicles and machinery, and routine checks should be done to ensure that these are in a good condition; • Appropriate solid waste management facilities (e.g. waste receptacles) must be provided on-site during construction and adequate signage should be provided; • The proper storage and handling of hazardous substances (hydrocarbons and chemicals) needs to be administered, e.g. storage within secondary containment and on impermeable surfaces away from water resources • The contractor shall take all reasonable steps to prevent the pollution of soil and/or groundwater by fuels and oils as a result of his activities; and	Duration of construction	Contractor Monitoring by ECO

Environmental Aspect	Potential Environmental Impact	Recommended Mitigation measures		
		Management and mitigation measure	**Time-frame**	**Responsibility**
		• Spill kits must be kept on site and workers must be trained on their use. Spillages should be cleaned up immediately and any contaminated soil from the construction site must be removed and disposed of at a permitted waste disposal facility.		
Earthworks, vehicle movement on unpaved surfaces, stockpiling of soils and vegetation clearing	Impacts on the air quality of the surrounding area, such as the generation of dust, and exhaust emissions, as well as impacts on surface and/ or groundwater resources through sedimentation from stormwater runoff from bare surfaces.	• Topsoil/ sand stockpiles are to be covered with appropriate material (e.g. hessian, shade cloth or plastic); • No burning of refuse or vegetation shall be permitted; • Excavated or spoil material (including any foreign materials) as well as topsoil stockpiles should not be placed within close proximity (at least 50 m) of wetlands or watercourses and should be stockpiled in a position that does not negatively alter the course of surface water flows on the site in order to reduce the possibility of material being washed downstream; • Limit vehicle speeds on the site for all vehicles; • Any erosion gullies/ channels created during construction should be filled immediately to ensure silt does not drain into the wetland; • Proper stormwater control measures to be implemented during the construction phase to prevent sediment, from cleared areas, flowing into watercourses downstream; • No stockpiling should take place within a water course; • Disturbed areas should be rehabilitated immediately after construction in the relevant area (with indigenous vegetation or using topsoil); • Rehabilitated areas should be monitored well and measures must be implemented to ensure that topsoil does not wash away; • Dust suppression techniques, such as wetting or covering potential dust sources, should be implemented to minimise the dust impact if required, especially on windy days; and • In open areas that are exposed to wind, wind screens should be used to reduce wind and also dust at the site and specifically to prevent dust blowing in the direction of the Logistics Park.	Duration of construction	Contractor
Workers on site	Positive: Opportunity for job creation Negative: Presence of construction workers on site may lead to various impacts on the surrounding area and disturbance to wildlife resulting from, ablutions, fires, noise, etc.	• Local contractors and labour should be considered for the construction phase; • Construction activities should be kept to normal working hours according to the relevant NMBM Noise Control By-Law and the Noise Control Regulations in terms of the Environmental Conservation Act (Act 73 of 1989) to reduce the noise impact to an acceptable level; • 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 to be permitted on site; • Equipment that is fitted with noise reduction facilities (e.g. side flaps, silencers, etc.) must be used as per operating instructions and maintained properly during site operations; • Maintenance of plant and machinery to be undertaken on a regular basis;	Duration of construction	Contractor

Environmental Aspect	Potential Environmental Impact	Recommended Mitigation measures		
		Management and mitigation measure	**Time-frame**	**Responsibility**
		• Surrounding landowners or occupiers of land should be informed before activities with extremely high noise levels (e.g. blasting) start • Hunting and harm to fauna by construction workers will be prohibited; • No fires are permitted on site; • Smoking shall only be permitted in designated smoking areas in the site camp; • A fire officer shall be appointed by the contractor who shall be responsible for co-ordinating rapid, appropriate responses in the event of a fire; and • Sufficient fire-fighting equipment shall be maintained and accessible on site at all times.		

Table 2: Mitigation and management measures for the operational phase

Environmental Aspect	Potential Environmental Impact	Recommended Mitigation measures		
		Management and mitigation measure	**Time-frame**	**Responsibility**
Stormwater management	Lack of appropriate stormwater management during operation could result in increased erosion and sedimentation of aquatic systems downstream	• Ongoing monitoring of the downstream wetland must be conducted to assess whether the wetland has been impacted by sedimentation and whether a a site specific rehabilitation plan is required; • Stormwater design and management for the site should be done according to a professionally compiled Stormwater Management Plan to ensure appropriate stormwater management during the operational stage; and • No stormwater should be released directly into the wetland and should preferably be retained on site.	Duration of operation	Client
Workers	Positive: Opportunity for job creation	• Local contractors and labour should be considered for the operation phase.	Duration of operation	Client

4 Monitoring, Reporting and Auditing

Site inspections by an Environmental Control Officer (ECO) must be conducted twice a month during construction to ensure continued compliance with the conditions of the environmental authorisation and the measures contained in the approved EMPr.

Monthly audit reports are to be prepared by the ECO and submitted to the developer, engineering representative, contractor, and competent authority.

5 Environmental Awareness Plan

On-site training must be provided for all contractors and personnel during both the construction and operational phases of the project. No personnel may be allowed onto site without having been instructed on the requirements of the approved EMPr and the Environmental Authorisation conditions.

The training must deal specifically with triggers that would require the implementation of mitigation measures contained in the EMPr. These include, but are not limited to:

- Identification and avoidance of environmentally sensitive features on/ near the site, specifically watercourses and wetlands;
- Identification of potential heritage resources (see Appendix C for guidelines for the identification of archaeological and historical material);
- Materials handling practices; and
- Waste management practices.

It is incumbent upon the contractor to convey the sentiments of the EMPr to all personnel involved in the construction operations (including sub-contractors) and the specific provisions of the EMPr. This should be done via regular toolbox talks as well as more formal training sessions, and attendance registers maintained for auditing purposes.

6 Organisational Structure

The general roles and responsibilities of various parties are outlined below.

6.1 The Developer: G5 Properties

G5 Properties shall ultimately be responsible for the implementation of the EMPr and shall appoint a representative, the Responsible Person (RP), who shall:

- Ensure that the Contractor is duly informed of the EMPr and associated responsibilities and implications of this EMPr;
- Monitor the Contractor's activities with regard to the requirements outlined in the EMPr;
- Act as a point of contact for local residents and community members;
- Ensure that the Contractor remedies problems in a timely manner and to the satisfaction of the authorities; and
- Notify the authorities and the Environmental Control Officer (ECO) should problems arise that are not remedied effectively, or of any change in the development or changes in project specification that could significantly impact negatively on the environment.

6.2 The Contractor

The contractor will be responsible for:

- Ensuring all activities on the site are undertaken in accordance with the EMPr;
- Informing all employees and sub-contractors of their roles and responsibilities in terms of the EMPr;

- Ensuring that all employees and sub-contractors comply with this EMPr; and
- The Contractor has a duty to demonstrate respect and care for the environment in which they are operating. They will be responsible for the cost of rehabilitation, to the satisfaction of the ECO, of any environmental damage that may result from non-compliance with the EMPr, environmental regulations and relevant legislation.

6.3 The Environmental Control Officer (ECO)

An Environmental Control Officer (ECO) who is a qualified environmental professional with the relevant environmental expertise, and independent of the RP, shall be appointed for the duration of the construction activities. The ECO's duties are as follows:

- The ECO shall undertake an initial site visit in conjunction with the Contractor, during which sensitive areas that should be avoided will be identified, and environmental concerns discussed;
- Photographs should be taken of the construction area and area allocated for the construction camp from logged (co-ordinate) points by the ECO before construction commences and after construction has been completed;
- Undertake monthly audits on the implementation of the EMPr and submit audit reports to SRK Consulting, the developer and the environmental authorities on request; and
- Undertake a post-construction inspection, which may result in recommendations for additional clean-up and rehabilitation measures.

7 EMPr Procedure

The EMPr implementation procedure is outlined below:

- The ECO shall undertake an initial site visit in conjunction with the RP and the Contractor, during which sensitive areas that should be avoided will be identified, and environmental concerns discussed;
- Photographs should be taken of the construction area and area allocated for the construction camp from logged (co-ordinate) points by the ECO before construction commences and after construction has been completed;
- The contractor shall train his employees regarding the importance of the EMPr;
- The ECO shall undertake monthly audits of the construction activities and submit the reports to DEDEAT, SRK Consulting and the developer in order to ensure that the EMPr is being implemented; and
- The ECO shall undertake a final audit of the site on completion of construction and submit a Final Audit Report to DEDEAT and the developer.

Appendices

Appendix A: CV of Environmental Assessment Practitioner

See Appendix H in Final BAR

Appendix B: Contractor Code of Conduct

G5 Properties (Pty) Ltd.

ENVIRONMENTAL CODE OF CONDUCT FOR BUILDING CONTRACTORS

Contractors shall ensure that all sub-contractors, employees, suppliers, agents, etc., are fully aware of the environmental issues detailed in the Environmental Management Programme. Contractors must investigate and comply with all existing regulations and laws/ bylaws unless the Relevant Authority grants specific written authority waiving compliance with any legislation.

The following list represents the basic Do's and Don'ts towards environmental awareness, which all participants in this project must consider whilst carrying out their tasks. These are not exhaustive and serve as a quick reference aid.

DO:

- Clear your work areas of litter and building rubbish at the end of each day – use the waste bins provided and ensure that litter will not blow away.
- Maintain waste removal system.
- Dispose of cigarettes and matches carefully. (These pose a fire risk and furthermore littering is an offence.)
- Use the toilet facilities provided and keep them clean.
- Report dirty or full toilet facilities.
- Prevent contamination or pollution of streams and water channels.
- Concrete batching areas should be appropriately placed and cement effluent from washing areas should be contained and evaporated and the remaining sludge disposed of at a registered disposal facility.
- Report injured animals.
- Report heritage remains immediately.
- Ensure that vehicles and machinery do not leak fuel or oils.
- Report all fuel or oil spills immediately & stop the spill continuing.
- Confine work and storage of equipment to within the immediate work area.
- Prevent excessive dust and noise.
- Use safety equipment and comply with all safety procedures.
- Ensure a working fire extinguisher is immediately at hand if any "hot work" is undertaken e.g. Welding, grinding, gas cutting etc.
- Drive on designated routes only.
- Respect existing services at all times.

DO NOT:

- Remove or damage vegetation without direct instruction.
- Injure, trap, feed or harm any animals – this includes birds, frogs, snakes, lizards etc.
- Remove any heritage remains.
- Make fires.
- Allow cement or cement bags to blow around.
- Litter or leave food lying around.
- Allow waste, litter, oils or foreign materials into streams.
- Enter any fenced off or marked area.
- Overnight on site.
- Speed or drive recklessly.

Appendix C: Guidelines for the identification of archaeological and historical material

Guidelines for the identification of archaeological and historical material

1. Human Skeletal material

Human remains, whether the complete remains of an individual buried during the past, or scattered human remains resulting from disturbance of the grave, should be reported. In general the remains are buried in a flexed position on their sides, but are also found buried in a sitting position with a flat stone capping and developers are requested to be on the alert for this.

2. Freshwater mussel middens

Freshwater mussels are found in the muddy banks of rivers and streams and were collected by people in the past as a food resource. Freshwater mussel shell middens are accumulations of mussel shell and are usually found close to rivers and streams. These shell middens frequently contain stone tools, pottery, bone, and occasionally human remains. Shell middens may be of various sizes and depths, but an accumulation which exceeds 1 m² in extent, should be reported to an archaeologist.

3. Stone artefacts

These are difficult for the layman to identify. However, large accumulations of flaked stones which do not appear to have been distributed naturally should be reported. If the stone tools are associated with bone remains, development should be halted immediately and archaeologists notified

4. Fossil bone

Fossil bones may be found embedded in geological deposits. Any concentrations of bones, whether fossilized or not, should be reported.

5. Large stone features

They come in different forms and sizes, but are easy to identify. The most common are roughly circular stone walls (mostly collapsed) and may represent stock enclosures, remains of wind breaks or cooking shelters. Others consist of large piles of stones of different sizes and heights and are known as isisivane. They are usually near river and mountain crossings. Their purpose and meaning is not fully understood, however, some are thought to represent burial cairns while others may have symbolic value.

6. Historical artefacts or features

These are easy to identify and include foundations of buildings or other construction features and items from domestic and military activities.

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