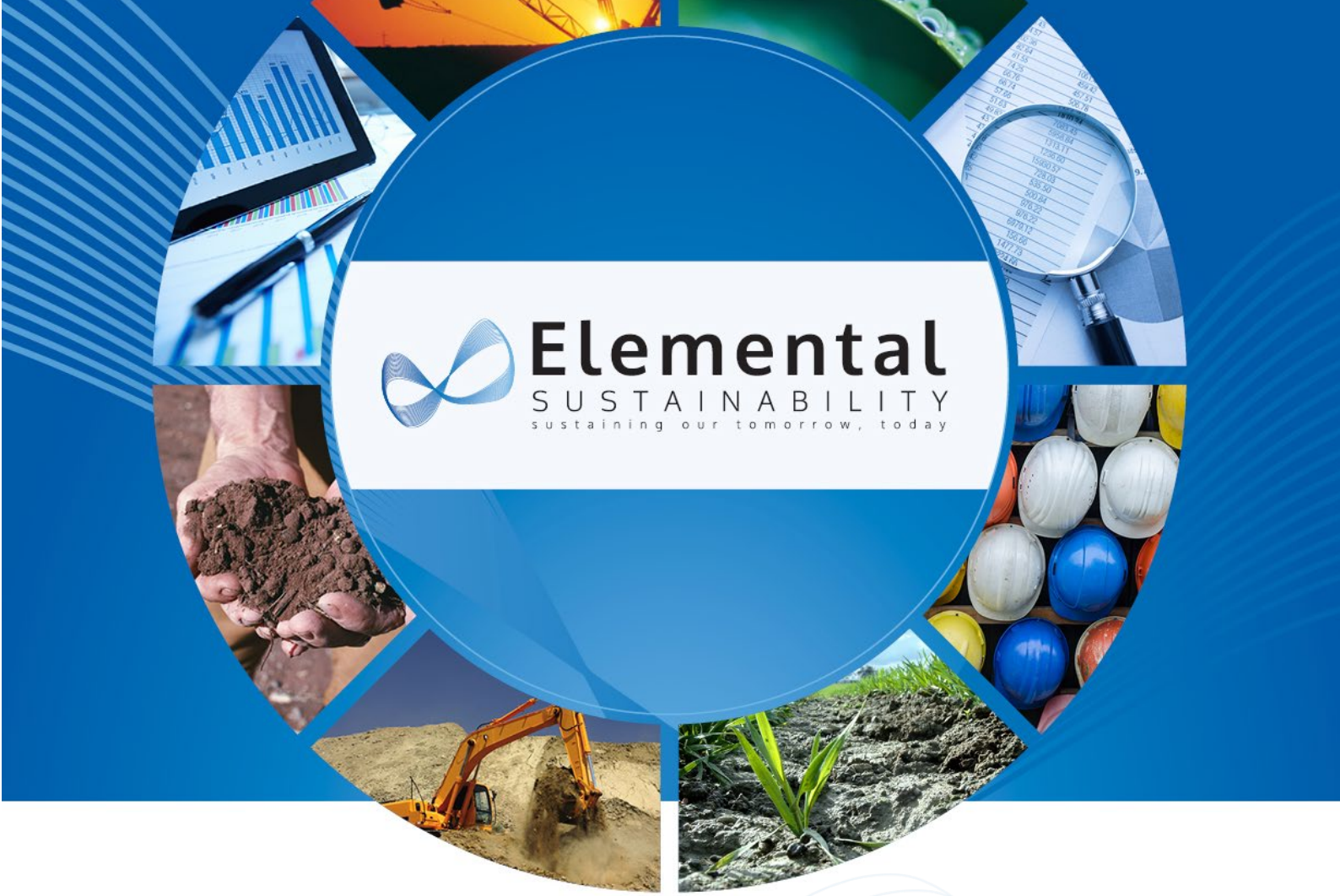

APPENDIX H
ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPR)
PEACH TREE EXT 28 TOWNSHIP DEVELOPMENT

FOR THE DEVELOPMENT OF A TOWNSHIP ON PORTIONS 814, 815 AND 816 OF THE FARM KNOPJESLAAGTE 385 JR, GAUTENG PROVINCE

Submitted in terms of the Environmental Impact Assessment Regulations, 2014 promulgated in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998)

NOVEMBER 2021

Environmental Safety & Sustainability Specialists

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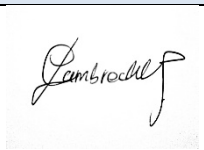
PROJECT INFORMATION

DOCUMENT CONTROL

Report	Draft Environmental Management Programme (EMPr) for the Peach Tree Ext 28 Township Development on portions 814, 815 and 816 of the farm Knopjeslaagte 385 JR, Gauteng Province.		
Client	Applicants: Mr Josef Lewis, Mrs Petro Smith Mr Marius du Plessis		
Responsible Person	Applicants/Clients– Owners of the land	kilosand@mweb.co.za; mariusdp@tshwane.gov.za	
Report Number	KS-BAR-REP-061_2020	**Report Status**	Draft for PPP
		Report Date	10 November 2021

DOCUMENT REVIEW

Responsible person	Date	Position	Responsibility	Signature
Corlien Lambrechts Pr.Sci.Nat. (No. 009135) EAPASA. (No. 2020-935)	2021/11/05	Senior EAP	Sign-off	
DuToit Wilken Pr.Sci.Nat. (No. 118911)	2021/11/05	Director	Reviewer	

DISCLAIMER

This document has been prepared by Elemental Sustainbility with reasonable skill, care and diligence, and taking account of the manpower, timescales and resources devoted to it in accordance with the appointment from the applicant.

In addition, this report has been compiled in line with the requirements of the National Environmental Management Act, 1998 (No. 107 of 1998) (NEMA) and EIA regulations (2014), as amended. Information reported herein may be based on the interpretation of public domain data collected by Elemental Sustainbility (Pty) Ltd, and/or information supplied by the applicant and/or its other advisors and associates. The data has been accepted in good faith as being accurate and valid. This document may contain information of a specialised and/or highly technical nature and the reader is advised to seek clarification on any elements which may be unclear to it.

REPORT CITATION:

Elemental-S (2021). Draft Environmental Management Report for Peach Tree Ext 28 Township Development on portions 814, 815 and 816 of the farm Knopjeslaagte 385 JR, Gauteng Province.

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APPENDICES

All Appendices has been included in Draft BAR if referenced. No additional Annexures are applicable.

1. INTRODUCTION

1.1 Purpose of the Environmental Management Programme

This Environmental Management Programme (EMPr) is prepared as part of the requirements of the Environmental Impact Assessment (EIA) Regulations (7 April 2017, as amended) promulgated under the National Environmental Management Act (NEMA) (Act 107 of 1998, as amended). The purpose of this Environmental Management Programme (EMPr) is to ensure "good environmental practice" by taking a holistic approach to the management and mitigation of environmental impacts during the construction and operation phase of Peach Tree Ext 28 Township Development. This EMPr therefore sets out the methods by which proper environmental controls are to be implemented by the facility's management. The Draft EMPr is submitted to the Gauteng Department of Agriculture and Rural Development (GDARD) as part of the Application for Environmental Authorisation.

This EMPr is considered as a document that can be updated as new information becomes available during the construction, operational and decommissioning phases, if applicable, of the proposed development. Mitigation measures need to be implemented as addressed in this EMPr, except where they are not applicable, and additional measures should be considered when necessary. The EMPr identifies the following:

- Construction and Operation activities that will impact on the environment;
- Specifications with which the facility's management shall comply in order to protect the environment from the identified impacts; and
- Actions that shall be taken in the event of non-compliance.

This EMPr incorporates management plans for the design, construction, operation and decommissioning phases of the project, which consist of the following components:

- **Impact**: The potential positive or negative impact of the development that needs to be enhanced, mitigated, or eliminated.
- **Objectives**: The objectives necessary in order to meet the goal; these consider the findings of the specialist studies.
- **Mitigation/Management Actions**: The actions needed to achieve the objectives, taking into consideration factors such as responsibility, methods, frequency, resources required and prioritisation.
- **Monitoring**: The key monitoring actions required to check whether the objectives are being achieved, taking into consideration responsibility, frequency, methods, and reporting.

1.2 Objectives of the EMPr

This EMPr has been compiled to provide recommendations and guidelines according to which compliance monitoring can be undertaken during all the phases of the development, including the construction and operational phases of Peach Tree Ext 28 Township Development, as well as to ensure that all relevant factors are considered to ensure an environmentally responsible development. This EMPr informs all relevant parties [the Applicant, the Contractor, the Site Manager (SM), the Environmental Control Officer (ECO) and all other staff employed on site] as to their duties in the fulfilment of the legal requirements for the construction and operational phases of the development with particular relevance to the prevention and mitigation of anticipated potential environmental impacts. All parties should note that obligations imposed by the EMPr are legally binding in terms of the EA granted by the GDARD.

The objectives of the EMPr are to:

- Ensure compliance with regulatory authority stipulations and guidelines which may be local, provincial, national and/or international;
- Ensure that there is sufficient allocation of resources on the project budget so that the scale of EMPr related activities (mitigation measures) are consistent with the significance of the project's impacts;
- Verify environmental performance through information on impacts as they occur;
- Respond to unforeseen events;
- Provide feedback for continual improvement on environmental performance;
- Identify a range of mitigation measures which could reduce and mitigate the potential impacts to minimal or insignificant level;
- Detail specific actions deemed necessary to assist in mitigating the environmental impact of the project;
- Identify measures that could optimise beneficial impacts;
- Create management structures that addresses the concerns and complaints of the I&APs with regards to the development;
- Establish a method of monitoring and auditing environmental management practices during all phases of the development;
- Ensure that safety recommendations are complied with; and
- Specify time periods within which the measures contemplated in the final EMPr should be implemented, where appropriate.

The point of departure for this EMPr is to ensure a pro-active rather than re-active approach to environmental performance by addressing potential problems before they occur. Therefore, the purpose of an EMPr is to provide management measures that should be implemented by Developers, Engineers and Contractors alike to ensure that the potential impacts of a development are minimised. It should also be ensured that the EMPr is maintained and upheld as a dynamic document in order for the project team to add or improve on issues that might be considered left out or not relevant to the project. In such instances the approving authority may authorise the ECO to make such changes.

1.3 Contents of the EMPr

This EMPr specifies the management actions necessary to ensure minimal environmental impacts, as well as procedures for monitoring these impacts associated with the proposed activity. In terms of legal compliance, this EMPr aims to satisfy appendix 4 of Government Notice Regulation 326 of 7 April 2017, presented in Table 2 below.

Table 1: Compliance with Appendix 4 of Government Notice Regulation 326 of 7 April 2017 and Section 24N of the National Environmental Management Act 107 of 1998.

Requirements according to Appendix 4 of GNR 982 of 4 December 2014	Section
(1) An EMPr must comply with section 24N of the Act and include- a) details of - (i) the EAP who prepared the EMPr; and (ii) the expertise of that EAP to prepare an EMPr, including a curriculum vitae;	Section 1.4
b) a detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;	Section 3
c) a map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that any areas that should be avoided, including buffers;	Section 3
d) a description of the impact management objectives, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including-	Section 6

(i) planning and design;	Section 6
(ii) pre-construction activities;	Section 6
(iii) construction activities;	Section 6
(iv) rehabilitation of the environment after construction and where applicable post closure; and	Section 6
(v) where relevant, operation activities;	Section 6
e) a description and identification of impact management outcomes required for the aspects contemplated in paragraph (d);	Section 6
f) a description of proposed impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraphs (d) and (e) will be achieved, and must, where applicable, include actions to – i. avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;	Section 6
ii. comply with any prescribed environmental management standards or practices;	Section 6
iii. comply with any applicable provisions of the Act regarding closure, where applicable; and	N/A
iv. comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable;	N/A
g) the method of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Section 6
h) frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Section 6
i) an indication of the persons who will be responsible for the implementation of the impact management actions;	Section 6
j) the time periods within which the impact management actions contemplated in paragraph (f) must be implemented;	Section 6
k) the mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);	Section 6
l) a program for reporting on compliance, taking into account the requirements as prescribed by the Regulations;	Section 6
m) an environmental awareness plan describing the manner in which- (i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and (ii) risks must be dealt with in order to avoid pollution or the degradation of the environment; and	Section 6
n) any specific information that may be required by the competent authority.	N/A

1.4 Environmental Assessment Practitioner

Name of the Practitioner:	Corlien Lambrechts	DuToit Wilken
Tel No.:	+27 64 618 2646	+27 84 588 2322
Email address:	corlien@elemental-s.co.za	dutoit@elemental-s.co.za
Company:	Elemental Sustainability (Pty) Ltd	
Postal address:	Postnet 39080 Moreleta Park Pretoria 0044	

NAME:	QUALIFICATION & EXPERTISE
Corlien Lambrechts Senior EAP	• B.Sc Hons – University of Pretoria • Pr.Sci.Nat. (No. 009135) • EAPASA. (No. 2020-935) • 8+ years' experience in the environmental management field
Corlien Lambrechts is an Environmental Scientist with 8 years of applicable experience in the relevant field of Environmental Management and has qualifications in Environmental Management and Zoology. She is a Professional Natural Scientist with the South African Council of Natural Scientific Professions (Pr.Sci.Nat: 009135) and has been registered and accredited by Environmental Assessment Practitioners Association of South Africa (EAPASA), Registration number: 2020/935. After consulting for a number of years, she enrolled for her Honors degree in Zoology at the University of Pretoria in 2015 where she completed a project in the Cathedral Peak Drakensberg Mountain range studying differences in community structures of invertebrate species between natural grasslands and grasslands subjected to rehabilitation by South African Environmental Observation Network (SAEON) and in association with the University of Pretoria Centre of Invasion Biology (CIB). During her career within the Environmental management field, she has been involved in a wide variety of Ecological and Environmental applications and compilation of reports, which include as relevant to the compilation of this report: Basic Assessment Reports, Scoping and Environmental Impact Assessment Reports and Environmental Management Plans, Environmental Audit Reports, Water-Use Application Reports and Mining Right Applications.	
DuToit Wilken Project Reviewer	• M.Sc. University of Pretoria, • Pr.Sci.Nat. (118911) • 10+ years' experience in the environmental management field
DuToit Wilken is an Environmental Scientist with more than 10 years of experience in applying the principles of Integrated Environmental Management, and in applying the Environmental Legislation to a number of development projects and initiatives in Southern Africa. He is registered as a Pr.Sci.Nat. (SACNASP), Natural Scientist, Registration number 118911. He has co-ordinated and managed number of diverse projects and programs related to the Environment and Mining within both the public and private sectors and for national, multi-national and international companies. His interpersonal and organisational skills have enabled him to efficiently direct these projects from initiation to implementation. A significant element of public participation is required throughout the life cycle of an EIA process. DuToit has successfully liaised with interested and affected parties, ensuring that all communication procedures and dialogues are open and transparent, and that capacity building is conducted where necessary. His proficient report-writing skills have been utilised for the compilation of a wide variety of reports, which include but is not limited to Basic Assessment Reports, Scoping and Environmental Impact Assessment Reports, Environmental Management Plans (Planning, Construction, Operation and Closure), Environmental Audit Reports, Opportunities and Constraints Analyses, Waste License Applications, Water-Use Application Reports and Mining Right Applications.	

2. IMPLEMENTATION OF THE EMPR

2.1 Legal Status

By virtue of the fact that this document describes mitigation measures that influence the outcome of the Environmental Authorisation process for this project and its implementation will be a requirement of the Environmental Authorisation issued by GDARD there exists a legal obligation for the specifications of this EMPr to be complied with. This EMPr includes all relevant documentation contained or referred to within it, along with any amendments or appendices to this document. The EMPr forms part of all contract documentation and is thus a legally binding document.

2.2 Legislative Context

The specifications and mitigation measures outlined in this EMPr must comply with relevant legislation. Of particular importance is Section 28 (1) of NEMA which places an obligation on all individuals to take due care of the environment and to ensure remedial action is instituted to minimise and mitigate environmental impacts. In terms of this Act an individual responsible for environmental damage must pay costs both to environment and human health and the preventative measures to reduce or prevent additional pollution and/or environmental damage from occurring. This is referred to as the Polluter Pays Principle. Listed below (Table 3) is the key legislation (relevant laws, permits and authorisations) applicable to the development. All relevant approvals and permits, or any other management requirements in terms of this, or any other legislation applicable to the development, as well as any future amendments to such legislation, are to be complied with. It should be noted that this is not a comprehensive list of all legislation that may apply, only those deemed most relevant to this context.

Table 2: Policy and Legislative Context

Description of compliance with the relevant legislation, policy or guideline:	
Legislation, policy of guideline	**Description of compliance**
Constitution of South Africa, 1996 (Act No. 108 of 1996) [as amended] Section 24 Environment: Everyone has the right- *(a) to an environment that is not harmful to their health or well-being; and* *(b) to have the environment protected, for the benefit of present and future generations through reasonable legislative and other measures that-* *(I) prevent pollution and ecological degradation;* *(II) promote conservation; and* Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.	The proposed development has the potential to harm the environment and could potentially poses a risk to the health and wellbeing of people (same with all developments). The Applicant has the overall responsibility to ensure that the rights of people in terms of Section 24 of the Constitution are protected in terms of the proposed development activity.
National Environmental Management Act, 1998 (Act No. 107 of 1998 as amended). • *Section 28 (1)* *Duty of Care and responsibilities to minimise and remediate environmental degradation.*	The Applicants are the developers and overall responsibility of the development rests with them, especially in terms of liabilities associated with the operational phase. The Environmental Authorisation for the proposed development is lawfully applied for in terms of the EIA Regulations, 2014 (as amended in 2017), promulgated under NEMA. The conditions on the Environmental Authorisation, if approved, will be adhered to.
GNR 326 of NEMA EIA Regulations, 7 April 2017 Listing Notice 1 & 3	To promote integrated environmental management, contents of this BAR adhere to the requirements of the EIA Regulations. Appendix H includes the Environmental Management Programme that the project will adhere to if authorisation is received.

	All the triggered activities as per National Environmental Management Act (Act No. 107 of 1998) have been listed in this document.
EIA Regulations, 2014 (Government Notices 982 - 984) (as amended) by GNR 324 – 327 in 2017. *Chapter 6: Regulation 39 to 44: Public Participation;* *Chapter 4: Application for Environmental Authorisation:* *Part 2 Basic Assessment* *Appendix 1: Basic Assessment Report* *Appendix 4: Environmental Management Programme* *Appendix 5: Closure Plan* *Appendix 6: Specialist Reports*	The EIA Regulations, 2014 [as amended] prescribes inter alia: The manner in which public participation needs to be conducted as well as the requirements of a basic assessment process and the content of a basic assessment report and environmental management programme. The content of specialist reports is also provided.
National Heritage Resources Act, 1999 (Act No. 25 of 1999) • *Section 44 (1);* *Preservation and protection of heritage resources;* • *Section 3 Types and ranges of heritage resources (i) (i);* *Objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens.*	The proposed project has been submitted to the South African Heritage Resources Agency (SAHRA) online platform South African Heritage Resources Information System (SAHRIS). Protection of indigenous heritage resources on the property. A specialist heritage investigation was conducted for the proposed site, and heritage aspects were found to occur on-site and is shown within this report along with the buffer zone recommended.
National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004) • *Section 9* *Norms and standards* • *Section 27* *Delegation of power and duties* • *Section 30* *Financial accountability* • *Section 43* *Biodiversity management plans.*	The National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004) as amended (NEMBA) including all the pertinent legislation published in terms of this act was considered in undertaking this Basic Assessment process. This included the determination and assessment of the fauna and flora prevailing in the proposed project and the handling thereof in terms of NEMBA. Indigenous vegetation needs to be protected and managed in accordance with management measures set out in the management plans. A specialist ecological scan and wetland assessment has been conducted for the project area; and the findings is represented within this report.
National Environmental Management Waste Act, 2008 (Act No. 59 of 2008)	The Waste Management practices has been assessed in respect of the National Environmental Management: Waste Act (Regulations published in GNR 921 (as amended by National Environmental Management Waste Act GNR 633 issued on 24 July 2015) as amended NEM: WA. However, it should be noted that the WWTW (for sewage) does not require a WML as such, but does trigger activities in terms of EIA Regulations. Sections of legislation published under this act will be applicable and adhered to.
National Water Act, 1998 (Act 36 of 1998)	An application for a Water Use Licence Application (WULA) will need to be lodged. However, it is not done concurrently with this

	application as the current land uses such as the mining operation (Kilo Sands (Pty) Ltd) present on the property needs to apply for closure and aims to do this accompanied with the EA (if granted) showing final land use as the township development.
National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004)	Impacts on surrounding landowners need to be managed through dust mitigation measures during construction. No significant air quality impacts are expected as a result of the township development. Dust is currently monitored on-site, since it is currently a sand mine with surrounding agriculture activities.
National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) [as amended]. In terms of section 21 of the NEM: AQA a list of scheduled processes was published in GNR893 (November 2013).	Impacts on surrounding landowners need to be managed through dust mitigation measures during construction. No significant air quality impacts are expected as a result of the township development. Dust is currently monitored on-site, since it is currently a sand mine with surrounding agriculture activities.
Veld and Forest Fire Act, 1998 (Act No. 101 of 1998) [as amended] • *Section 12 (1)* *Duty of the landowner to prevent fire from spreading to neighbouring properties.*	Cautionary steps in avoiding the spread of fires to and from neighbouring properties. This will specifically be important since township developments will hold a significant risk to the residents if a fire breaks out as human lives could be at stake.
Alien and Invasive Species Regulations (Government Notice 598 of 2014) and Alien and Invasive Species List, 2014 in terms of NEMBA (Government Notice 599 of 2014) • *Notice 2* *Exempted Alien Species in terms of Section 66 (1)* • *Notice 3* *National Lists of Invasive Species in terms of Section 70(1) – List 1, 3-9 & 11* • *Notice 4* *Prohibited Alien Species in terms of Section 67 (1) – List 1, 3-7, 9-10 & 12*	It is the responsibility of the Applicants to ensure that all prohibited plant and animal species are eradicated as far as possible. A specialist ecological scan and wetland assessment has been conducted for the project area; limited natural indigenous vegetation is present on the area.
Conservation of Agricultural Resources Act (no. 43 of 1983) • *Section 5: Prohibition of spreading of weeds* • *Section 12: Maintenance of soil conservation works and maintenance of certain states of affairs* *Section 16: Regional Conservation Committees*	Listed invader/alien plants occurring on site which requires management measures to be implemented.
Hazardous Substances Act, 1973 (Act 15 of 1973) [as amended] • *Section 2: Declaration of grouped hazardous substances;* • *Section 4: Licensing;* • *Section 16: Liability of employer or principle*	The Applicant must ensure the safety of people working with hazardous chemicals (specifically fuels), as well as safe storage, use and disposal of containers during the on-site operational phase together with the associated liability should non-compliance be at the order of the day.

• *Section 9 (1): Storage and handling of hazardous chemical substances;* • *Section 18: Offences*	
National Dust Control Regulations, 2013 (Government Notice 827 of 2013) • *Section 3* *Dust fall standard* • *Section 4* *Dust fall monitoring program* • *Section 6* *Measures for control of dust* • *Section 7* *Ambient air quality monitoring (PM_{10})* • *Section 8* *Offences* • *Section 9* *Penalties*	Impacts on surrounding landowners need to be managed through dust mitigation measures during construction. No significant air quality impacts are expected as a result of the township development. Dust is currently monitored on-site, since it is currently a sand mine with surrounding agriculture activities.
National Ambient Air Quality Standard (NAAQS) (29 June 2012 (No. 35463)).	Standard for ambient air quality in South Africa. Monitoring requirements, limits and standards. Impacts on surrounding landowners need to be managed through dust mitigation measures during construction. No significant air quality impacts are expected as a result of the township development. Dust is currently monitored on-site, since it is currently a sand mine with surrounding agriculture activities.
SANS 1929: Ambient Air Quality – Limits for Common Pollutants SANS 1137: Standard test method for the collection and measurement of dust fall (settleable particulate matter). ASTM d 1739, 1970 or equivalent approved protocol for dust monitoring.	Impacts on surrounding landowners need to be managed through dust mitigation measures during construction. No significant air quality impacts are expected as a result of the township development. Dust is currently monitored on-site, since it is currently a sand mine with surrounding agriculture activities.
National Development Plan: A Vision for 2030	The South African Government through the Presidency has published a National Development Plan. The Plan aims to eliminate poverty and reduce inequality by 2030. The Plan has the target of developing people's capabilities to be to improve their lives through education and skills development, health care, better access to public transport, jobs, social protection, rising income, housing and basic services, and safety. It proposes the following strategies to address the above goals: 1. Creating jobs and improving livelihoods; 2. Expanding infrastructure; 3. Transition to a low-carbon economy; 4. Transforming urban and rural spaces; 5. Improving education and training;

	6. Providing quality health care; 7. Fighting corruption and enhancing accountability; 8. Transforming society and uniting the nation.
Public Participation guideline in terms of NEMA EIA Regulations, Department of Environmental Affairs, 2017	This guideline has informed the public participation process for the project.
Hazardous Chemical Substances Regulations, 1995 (Government Notice 1179 of 1995) • *Section 4: Duties of persons who may be exposed to hazardous chemical substances* *Section 9A (1): Penalties*	No Hazardous substances will be stored on the site.
• Relevant South African National Standards: ○ **SANS 10400**: The application of National Building Regulations; ○ **SANS 5667:** Water quality ○ **SANS 10103:** The measurement and rating of environmental noise with respect to annoyance and to speech communication	Adherence to all necessary standards to ensure safety and minimal risk of development.
SANS 10228:2006 The Identification and Classification of Dangerous Goods for Transport	All dangerous goods to be transported to and from the site need to be managed according to these standards during construction. No permanent presence or storage is proposed and may only be required during construction of the township.
National Development Plan 2030 (2012)	Land use planning.
National Strategy for Sustainable Development and Action Plan 2011 – 2014 (NSSD 1) (2011)	Land use planning.
Development Guidelines for Ridges (GDARD)	Ridges have been identified and delineated within the Gauteng Province by GDARD. Based on the specialist findings, no identified ridges are located within the area or within 200m of the site.
Gauteng Conservation Plan: Version 3.3	Identifies Critical Biodiversity Areas, Ecological Support Areas, and irreplaceable, protected, and important areas. Planning Tool utilised during the Terrestrial Ecology assessment. The data as presented in the plan was verified during the field assessment. The area does have areas of importance in terms of the C-Plan including sensitive areas identified in the ecological assessment conducted.
Gauteng Department of Agriculture and Rural Development (GDARD) Minimum Requirements for Biodiversity Assessments (2014).	The biodiversity assessment undertaken was completed in terms of the requirements. Refer to Appendix G.
National Spatial Development Perspectives (NSDP)	The NSDP (2006) provides a framework for a focused intervention by the State in equitable and sustainable development. It

	represents a key instrument in the State's drive towards ensuring greater economic growth, buoyant and sustained job creation, and the eradication of poverty. It provides: • a set of principles and mechanisms for guiding infrastructure investment and development decisions; • description of the spatial manifestations of the main social, economic and environmental trends that should form the basis for a shared understanding of the national space economy; and • an interpretation of the spatial realities and the implications for government intervention. The project has taken municipal-level spatial planning into account where possible.
New Growth Path (2010)	South Africa has embarked on a new economic growth path in a bid to create 5 million jobs and reduce unemployment from 25% to 15% over the next ten (10) years. The plan aims to address unemployment, inequality and poverty by unlocking employment opportunities in South Africa's private sector and identifies seven job drivers. These job drivers have the responsibility to create jobs on a large scale. The seven key economic sectors or "job drivers" for job creation are listed below: • infrastructure development and extension: Public works and housing projects; • agricultural development with a focus on rural development and specifically • Agro-Processing; • mining value chains; • manufacturing and industrial development (IPAP); • knowledge and green economy; • tourism and services; and • informal sector of economy. Employment opportunities, direct and in-direct will be provided by the proposed activity.
National Framework for Sustainable Development (2008)	The purpose of the National Framework on Sustainable Development is to enunciate South Africa's national vision for sustainable development and indicate strategic interventions to re-orientate South Africa's development path in a more sustainable direction. It proposes a national vision, principles and areas for strategic intervention that will enable and guide the development of the national strategy and action plan.
National Spatial Development Perspective (2006)	The NSDP 2006 provides a framework for a focused intervention by the State in equitable and sustainable development. It

	represents a key instrument in the State's drive towards ensuring greater economic growth, buoyant and sustained job creation and the eradication of poverty. Employment opportunities, direct and in-direct will be provided by the proposed activity.
Gauteng 10-Pillar Programme of Transformation, Modernisation and Re-industrialisation	The 10-Pillar Programme for the economic, social and spatial transformation of Gauteng, includes the two pillars most relevant to the project which are "decisive spatial transformation" and "modernisation of human settlements and urban development". To achieve radical and decisive spatial transformation will require key elements, including: • Transforming the Apartheid spatial economy and human settlement patterns to integrate economic opportunities, transport corridors and human settlements. • Revitalising and mainstreaming the township economy. • Enhancing the competitiveness of strategic economic sectors. • Significant investment in economic infrastructure.
Gauteng Employment and Growth Strategy (GEGDS) (2009 to 2014)	The strategy was formulated by the Department Economic Development. The strategy is based on innovation, green growth and an inclusive economy. • Increased economic equity and ownership: SMME development, access to quality education, support cooperatives, procurement support. The township will contribute to SMME development and provide employment opportunities, direct and in-direct, but will also provide housing and services and as a result general development of the area in question.
City of Tshwane Spatial Development Framework	The City of Tshwane Spatial Development Framework states that the purpose of the designated agricultural land is to conserve the high potential agricultural areas and to promote food security. The SDF is clear that the supported land uses in the project area include agriculture, agricultural product beneficiation, agricultural schools, agro-processing, farmers market, commercial farming, and related activities.
City of Tshwane - The Land and Legislation and Application Management (LULAM)	The Land and Legislation and Application Management (LULAM) • the management and maintenance of the Tshwane Town-planning Scheme 2008 • the process relation to the land-use application and • the naming of public places and street names. The Section manages and maintains the Tshwane Town-planning Scheme of 2008 and the information planning to land-use rights

	(zonings, consent uses and permissions) which forms a critical component of the valuation system. To assist the public and consultants in submitting land use application in accordance with the correct legislation and to advise them on the documentation that must accompany these applications, the Section has manuals available on all the types of land use application. It must be noted that various sets of legislation regulate the submission of land-use applications. The Section revises the tariffs and documents related to these applications each year and ensures that the application process proceed smoothly and expeditiously. A new electronic processing system for the administration of land-use applications is being developed.
Regional Development Framework (RSDF 2018) - City of Tshwane – Metropolitan Spatial Development Framework 2012 (Chapter 1)	The development falls into "Region 4 (Ward 48)": "This region is to be found in the south-western corner of the COT. The following opportunities are to be found within the region: • Centurion Metropolitan core • Gautrain Station • Highveld Technopark • N1 Commercial Development Corridor • Samrand commercial and industrial node • Potential development along R21 towards OR Tambo International Airport • Olievenhoutbosch NDPG programme • Centurion Lake This region is one of the more affluent regions of the municipality. Its strategic location along the border of Johannesburg has meant that it has progressively developed further towards the south as the growing attraction to the convenience and economic sense of its location has grabbed the attention of many investors. The Highveld Technopark is one such development that is testament to this. Other predominant land uses of strategic significance include the Zwartkop and Waterkloof Military Airports, Centurion CBD, Sunderland Ridge Industrial Area, N1 Corridor (commercial development), Louwlardia Commercial and Industrial area and Samrand. The Gautrain Station will add impetus to the development in and around the area. Apart from infrastructure requirements and development trends, the low densities are also influenced by the underlying dolomite in the area. Vacant areas within the suburban environment have recently developed extensively with densities varying from 60 units per hectare. There still exists an opportunity to extend residential developments in the westerly direction (Monavoni and surrounds).

	Though well serviced, the provision of bulk services is lagging behind the rapid population growth. Existing infrastructure requires upgrading and maintenance." Therefore, a township development will suit the Region and its needs in terms of rapid population growth. However, the area is marked as "Extensive general agriculture hinterland in the GSDF 2010
Gauteng Province Environmental Management Framework, 2014 (GPEMF) *Zone 1*	A Section of the Peach Tree Ext 28 township development falls within Zone 1 as identified by the GPEMF: The Gauteng Provincial Environmental Management Framework has been used to assist in the determination of land use zones and to guide sustainable land use management. The study area where the activity is proposed, is located within the Gauteng Province. The area is located within Zone 1: Urban development zone, of the GPEMF. The intention with this zone is to streamline urban development activities in it and to promote development infill, densification, and concentration of urban development, in order to establish a more effective and efficient city region that will minimise urban sprawl into rural areas.

3. PROJECT BACKGROUND

3.1 Project Activities

The proposed project involves Peach Tree Ext 28 Township Development on Portions 814, 815 and 816 of the Farm Knopjeslaagte 385 JR, Gauteng Province. (Figure 1). The project forms part of the City of Tshwane Local and District Municipality. The farm portions are 108 hectares and a large section of this had previously been used as mining (Kilo Sands (Pty) Ltd. A closure certificate still needs to be issued to Kilo Sands and as part of the applicants for the Peach Tree Ext 28 Application, Kilo Sands wishes to submit the EA (if granted) as part of its final land use plan.

A section of the properties also falls within the exemption zones of Zone 1 as identified by the GPEMF. The area is located within Zone 1: Urban development zone, of the GPEMF. The intention with this zone is to streamline urban development activities in it and to promote development infill, densification, and concentration of urban development, in order to establish a more effective and efficient city region that will minimise urban sprawl into rural areas.

The proposed township will consist of a total of 31 erven, just over 108 hectares, including residential, business, open spaces, private and public roads. The below diagram provides a depiction of the proposed layout.

- The proposed township development land use will be as follow:
- Residential – 24 Erven at a total of 56.6 hectares (55.1%).
- Business – 1 Erf at a total of 6.7 hectares (6.2%).
- Private open space – 4 Erven at a total of 25.2 hectares (23.3%).
- Private roads – 2 Erven at a total of 4 hectares (3.8%) – a private road is planned to be constructed over the watercourses at the southern and northern borders of the project footprint.

- Public roads – 12.5 hectares (11.6%).

The following Bulk Services that may be required includes

- Sewerage which will be serviced by the City of Tshwane as sufficient capacity is available. The Sunderland Ridge WWTW will accommodate the development until the Schurveberg WWTW has been constructed. As alternative B, an on-site Sewerage Treatment Facility (STF) is proposed.
- Water provision for the proposed project will be supplied by a new Rand Water pipeline feeding into the proposed Knopjeslaagte Reservoir still to be constructed.
- Power will be supplied by the City of Tshwane (COT) Power Supply Network with the possibility of installing an on-site Switching Station
- Storm water management plan still needs to be approved in consultation with COT.
- Access roads to and on the site are already in existence, internal road infrastructure will be constructed

3.2 Listed Activities

Listed activities defined under the National Environmental Management Act, Act No. 107 of 1998 (NEMA, 1998), as amended, in terms of the amended Environmental Impact Assessment (EIA) Regulations, Government Notice (GNR) 326 of 7 April 2017, will take place. Relevant listed activities triggered by the proposed activities are described in Table 3.

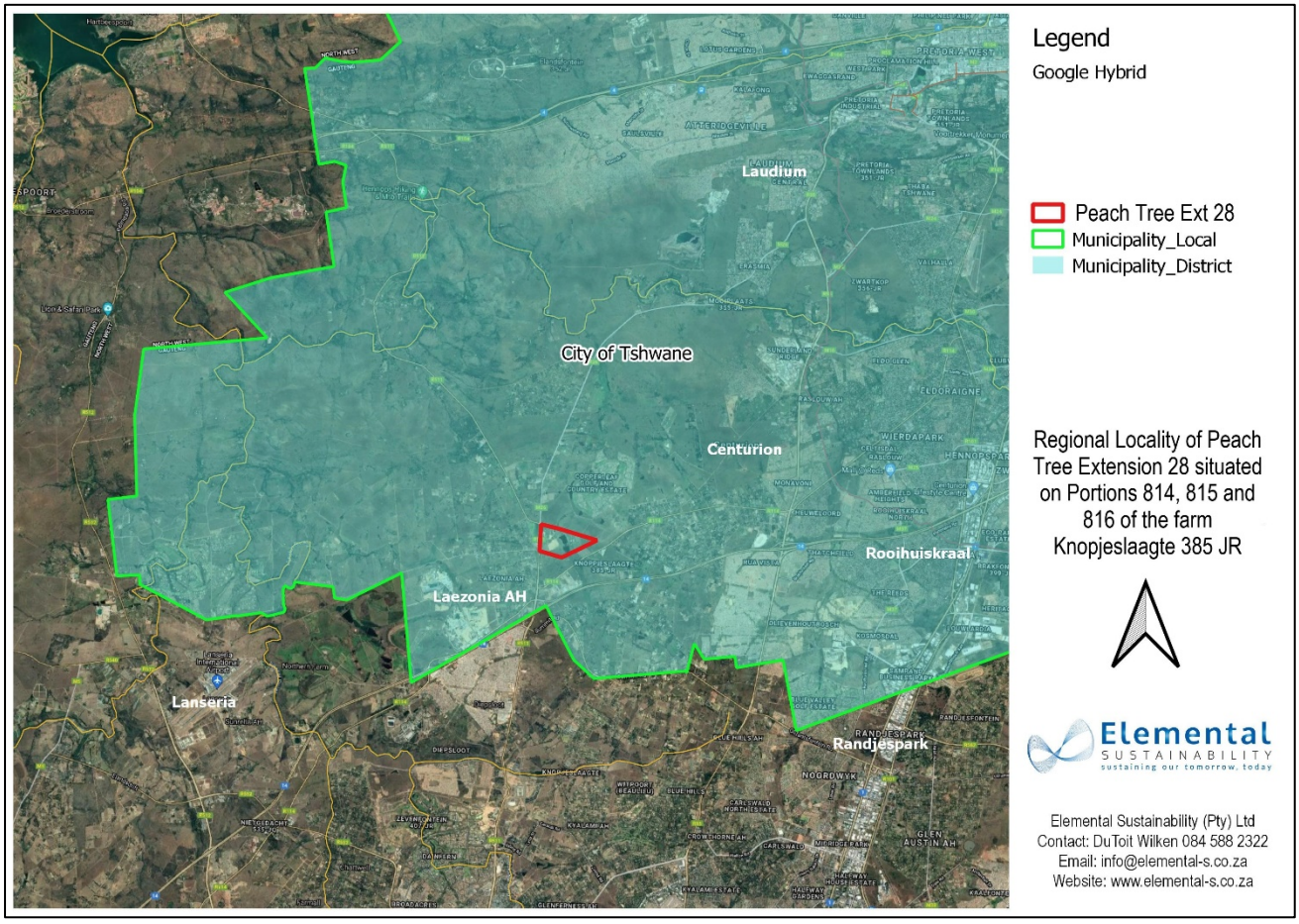

Figure 1: Site location of the Peach Tree Ext 28 Township Development, Gauteng Province

Table 3: Listed Activities as described in GNR 326 of 7 April 2017

Relevant Notices:	Activity No (s) (in terms of the relevant notice):	Description of each listed activity as per the Government Notice:	Description of each listed activity as per the project description
GN R327	**Listing Notice 1**		
	Listing Notice 1 Activity 9	The development of infrastructure exceeding 1 000 metres in length for the bulk transportation of water or storm water — (i) with an internal diameter of 0,36 metres or more; or (ii) with a peak throughput of 120 litres per second or more; excluding where — (a) such infrastructure is for bulk transportation of water or storm water or storm water drainage inside a road reserve or railway line reserve; or (b) where such development will occur within an urban area.	More than 1000m length of storm water channels, 3m wide is proposed alongside all the roads proposed to be developed and also at the edge of the property. Pipes ranging between 250mm – 600mm proposed for both systems
	Listing Notice 1 Activity 10	The development and related operation of infrastructure exceeding 1 000 metres in length for the bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes – (i) with an internal	Sewage management will also form part of the township development, with a Sewerage Treatment Facility proposed as an Alternative B to the municipal treatment provision. See Appendix G of

		diameter of 0,36 metres or more; or (ii) with a peak throughput of 120 litres per second or more; excluding where — (a) such infrastructure is for the bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes inside a road reserve or railway line reserve; or (b) where such development will occur within an urban area.	the Draft BAR for Engineering Services Report. This will be handled in the Water Use License Application, which needs to be approved before the development will take place. Sewerage networks and services are included in the layout by the Engineer.
	Listing Notice 1 Activity 11	The development of facilities or infrastructure for the transmission and distribution of electricity — (i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts; or (ii) inside urban areas or industrial complexes with a capacity of 275 kilovolts or more; excluding the development of bypass infrastructure for the transmission and distribution of electricity where such bypass infrastructure is — (a) temporarily required to allow for maintenance of existing infrastructure; (b) 2 kilometres or shorter in length; (c) within an existing transmission line servitude; and (d) will be removed within 18 months of the commencement of development.	The Proposed Development could be supplied by building a new Switching Substation on the border of the Proposed Development. The Switching Substation could be supplied by installing 4 x 150mm^2 3-core, 11 kV PILC insulated copper cables from the Mnandi Substation towards the northeast of the Proposed Development. The Proposed Development could then be supplied from the Mnandi Substation with 6 x 70mm^2, 3-core, 11 kV PILC insulated copper cables.
	Listing Notice 1 Activity 12	The development of — (i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres; or (ii) infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs — (a) within a watercourse; (b) in front of a development setback; or (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse; — excluding — (aa) the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour; (bb) where such development activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies; (cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies; (dd) where such development occurs within an urban area; (ee) where such development occurs within existing roads, road reserves or railway line reserves; or (ff) the development of temporary infrastructure or structures where such infrastructure or structures will be removed within 6 weeks of the	Crossings, culverts/storm water management and roads will be developed and widened impacting within 32 m of the Swartbooispruit. These activities may require infilling or excavations from the watercourse (within 32).

		commencement of development and where indigenous vegetation will not be cleared.	
	Listing Notice 1 Activity 19	The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse; but excluding where such infilling, depositing, dredging, excavation, removal or moving — (a) will occur behind a development setback; (b) is for maintenance purposes undertaken in accordance with a maintenance management plan; (c) falls within the ambit of activity 21 in this Notice, in which case that activity applies; (d) occurs within existing ports or harbours that will not increase the development footprint of the port or harbour; or (e) where such development is related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies.	Crossings, culverts/stormwater management and roads will be developed and widened impacting within 32 m of the Swartbooispruit. These activities may require infilling or excavations from the watercourse (within 32).
	Listing Notice 1 Activity 24	The development of a road — (i) for which an environmental authorisation was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in Government Notice 545 of 2010; or (ii) with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres; but excluding a road — (a) which is identified and included in activity 27 in Listing Notice 2 of 2014; (b) where the entire road falls within an urban area; or (c) which is 1 kilometre or shorter.	Roads up to 25 m will be created and a large existing road reserve (K52) falls within the development, this reserve is existing, but no road has been established as off yet.
	Listing Notice 1 Activity 25	The development and related operation of facilities or infrastructure for the treatment of effluent, wastewater or sewage with a daily throughput capacity of more than 2 000 cubic metres but less than 15 000 cubic metres.	The Engineering Services Report propose a Sewerage Treatment Facility (STF) as an alternative B to the proposed Alternative A: Municipal bulk connection. The STF is to process 4500 cubic meters of effluent daily.
	Listing Notice 1 Activity 26	Residential, retail, recreational, tourism, commercial or institutional developments of 1 000 square metres or more, on land previously used for mining or heavy industrial purposes; — excluding — (i) where such land has been remediated in terms of part 8 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case the National Environmental Management: Waste Act, 2008 applies; or (ii) where an environmental authorisation has been obtained for the decommissioning of such a mine or industry in terms of this Notice or any previous NEMA notice; or (iii) where a closure certificate has been issued	The farm portions are 108 hectares and a large section of this had previously been used as mining (Kilo Sands (Pty) Ltd. A closure certificate still needs to be issued to Kilo Sands and as part of the applicants for the Peach Tree Ext 28 Application, Kilo Sands wishes to submit the EA (if granted) as part of its final land use plan. The erven to be developed measure 68.18 hectares (erven). The remainder make out roads and storm water sections. Limited indigenous vegetation will be cleared since almost all of the properties

		in terms of section 43 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) for such land.	had been impacted by either mining or agricultural lands and/or fall into GPEMF Zone 1 A section of the properties also falls within the exemption zones of Zone 1 as identified by the GPEMF. The area is located within Zone 1: Urban development zone, of the GPEMF. The intention with this zone is to streamline urban development activities in it and to promote development infill, densification, and concentration of urban development, in order to establish a more effective and efficient city region that will minimise urban sprawl into rural areas.
	Listing Notice 1 Activity 27	The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for — (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.	Clearance is required, but indigenous vegetation is limited/impacted due to existing agricultural and mining land uses. The area of indigenous vegetation to be cleared measure less than 20 hectares, because most of it is pasture (planted grass for feed) or sand mining activities or the dams, which will not be cleared within the prescribed buffer zones. A section of the properties also falls within the exemption zones of Zone 1 as identified by the GPEMF. The area is located within Zone 1: Urban development zone, of the GPEMF. The intention with this zone is to streamline urban development activities in it and to promote development infill, densification, and concentration of urban development, in order to establish a more effective and efficient city region that will minimise urban sprawl into rural areas.
	Listing Notice 1 Activity 28	Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 01 April 1998 and where such development: (i) will occur inside an urban area, where the total land to be developed is bigger than 5 hectares; or (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare; excluding where such land has already been	Sections of the area is utilised as agriculture and will now be developed to a residential and commercial development.

		developed for residential, mixed, retail, commercial, industrial or institutional purposes.	
GNR 324	**Listing Notice 3**		
	Listing Notice 3 Activity 2	The development of reservoirs, [for bulk water supply] excluding dams, with a capacity of more than 250 cubic metres.	A 12 Megalitre (12 000m^3) Reservoir is proposed
	Listing Notice 3 Activity 4	The development of a road wider than 4 metres with a reserve less than 13,5 metres.	Roads up to 25 m will be created and a large existing road reserve (K52) falls within the development, but this reserve is existing, but no road has been established as off yet.
	Listing Notice 3 Activity 12	The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.	Clearance is required, but indigenous vegetation is limited/impacted due to existing agricultural and mining land uses, but present.
	Listing Notice 3 Activity 14	The development of—(i)dams or weirs, where the dam or weir, including infrastructure and water surface area exceeds 10 square metres; or (ii)infrastructure or structures with a physical footprint of 10 square metres or more; where such development occurs—(a)within a watercourse; (b)in front of a development setback; or (c)if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse; excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour.	Crossings, culverts/storm water management and roads will be developed and widened impacting within 32 m of the Swartbooispruit. These activities may require infilling or excavations from the watercourse (within 32).

4. ENVIRONMENTAL MANAGEMENT STRUCTURE

Peach Tree Ext 28 Township Development' management will develop an Environmental Management Structure, in line with this EMPr, that is appropriate to the size and scale of the project to develop and implement roles and responsibilities with regards to environmental management. The Applicant (current landowners), with assistance from the Site Manager (SM), is responsible for the implementation of the EMPr and for internal compliance monitoring of the EMPr. The EMPr will be made binding on all contractors operating on the site and will be included with the official contract documentation of each of the principal contractors to be appointed to the contract. A schedule of fines for environmental damage or EMPr transgressions will be implemented. The Applicant must appoint an Environmental Site Manger (SM), fulfilling the duties of internal Environmental Control Officer (ECO), who will monitor and facilitate compliance with the EMPr and other conditions of approval as they relate to environmental matters.

4.1 Roles and Responsibilities

Key roles and responsibilities in order to meet the overall goal for environmental management of the proposed township development expansion are as follows:

Peach Tree Ext 28 Townships' Management (hereafter referred to as "Management")

Management is responsible for the overall environmental monitoring and implementation of the EMPr and ensuring compliance thereof with the specifications of the Environmental Authorisation (EA) issued in terms of NEMA. Management should also ensure that any other permits or licences required as part of this project are obtained and complied with. The applicant may however, at their own costs, render the services of an external environmental consultant to oversee the implementation of the documented mitigation measures of this EMPr. It is also expected that management will appoint an Environmental Control Officer (ECO), Environmental Health and Safety (EHS) Officer, and Construction Manager.

Environmental Control Officer (ECO)

The ECO will be the responsible person for ensuring that the provisions of the EMPr as well as the EA are complied with at all times. The ECO must fully communicate the environmental management processes associated with the project, particularly the EMPr, as well as review and ensure compliance with the conditions of the EMPr. The ECO will be responsible for issuing instructions to contractors and employees in terms of actions required with regards to environmental considerations. The ECO shall, on a regular basis, prepare and submit written reports to Management and the Competent Environmental Authority (GDARD) as required.

Environmental Officer (EO)

It is important to note that the EO or Manager will be appointed to fulfil the roles of the Environmental Officer during the construction phase and that of the Environmental Manager during the operational phase. A generic term has therefore been assigned to this sector of roles and responsibilities. The responsibility of the Manager includes overseeing the implementation of the EMPr during the construction and operational phases, monitoring environmental impacts, record-keeping and updating of the EMPr as and when necessary. The Manager is also responsible for monitoring compliance with the conditions of the Environmental Authorisation that may be issued to the Applicants.

The lead contractor and sub-contractors may have their own Environmental Officers or designate Environmental Officer functions to certain personnel.

During construction, the Manager will be responsible for the following:

- Meeting on site with the Construction Manager prior to the commencement of construction activities to confirm the construction procedure and designated activity zones.
- Daily or weekly monitoring of site activities during construction to ensure adherence to the specifications contained in the EMPr and Environmental Authorisation (should such authorisation be granted by GDARD), using a monitoring checklist that is to be prepared at the start of the construction phase.
- Preparation of the monitoring report based on the daily or weekly site visit.
- Reporting of any non-conformances within 48 hours of identification of such non-conformance to the relevant agents.
- Conducting an environmental inspection on completion of the construction period and 'signing off' the construction process with the Construction Manager.

During operation, the Manager will be responsible for:

- Overseeing the implementation of the EMPr and monitoring programmes for the operation phase.
- Reviewing the findings of the monitoring and highlight concerns to management and TNPA where necessary.
- Ensuring compliance with the Environmental Authorisation conditions.

- Ensuring that the necessary environmental monitoring takes place as specified in the EMPr.
- Updating the EMPr and ensuring that records are kept of all monitoring activities and results.

During decommissioning, the Manager will be responsible for:

- Overseeing the implementation of the EMPr for the decommissioning phase; and
- Conducting an environmental inspection on completion of decommissioning and 'signing off' the site rehabilitation process.

At the time of preparing this EMPr, the Manager appointment is still to be made by the applicant. The appointment of the Environmental Officer is dependent upon the project receiving Environmental Authorisation (EA) and proceeding to the construction phase.

Construction Manager

The construction manager will be responsible for the following:

- Overall construction programme, project delivery and quality control for the construction of the facility.
- Overseeing compliance with the Health, Safety and Environmental responsibilities specific to the project construction.
- Promoting total job safety and environmental awareness by employees, contractors and subcontractors and stress to all employees and contractors and sub-contractors the importance that the project proponent attaches to safety and the environment.
- Ensuring that each subcontractor employs an Environmental Officer (or have a designated Environmental Officer function) to monitor and report on the daily activities on-site during the construction period.
- Ensuring that safe, environmentally acceptable working methods and practices are implemented, and that sufficient plant and equipment is made available, is properly operated and maintained in order to facilitate proper access and enable any operation to be carried out safely.
- Meeting on site with the Manager prior to the commencement of construction activities to confirm the construction procedure and designated activity zones.
- Ensuring that all appointed contractors and sub-contractors are aware of this EMPr and their responsibilities in relation to the programme.
- Ensuring that all appointed contractors and sub-contractors repair, at their own cost, any environmental damage as a result of a contravention of the specifications contained in the EMPr, to the satisfaction of the Manager.

At the time of preparing this Draft EMPr, a construction manager has not been appointed and appointment will depend on the project receiving EA and proceeding to the construction phase.

5. SUMMARY OF SPECIALIST REPORTS

Table 4: Summary of specialist reports utilised in the environmental authorisation process

Terrestrial Biodiversity Assessment – June 2021

Red Kite Environmental Solutions (Pty) Ltd (Red Kite Environmental Solutions (Pty) Ltd, 2021) was appointed by Elemental Sustainability (Pty) Ltd to conduct a Terrestrial Ecology Assessment for the proposed Peachtree Ext 28 township development The ecological findings (desktop and site survey) identified the following features:

Currently sand mining and associated activities are being undertaken on the western section of the project area. Run-off is directed away from the quarry in order to prevent flooding of the pit. Water is directed to the settling dams, this water is reused for wetting of roads and other exposed surfaces to prevent dust pollution as well as recycled to use in the washing process.

As part of the final land use planned for the mining right area, a township development is proposed. The proposed township will consist of a total of 31 erven, just over 108 hectares, including residential, business, open spaces, private and public roads.

The project footprint falls within the Egoli Granite Grassland, which is listed as Endangered in the "National List of Ecosystems that are Threatened and need of protection", and as Critically Endangered by the 2018 National Biodiversity Assessment.

Information on plant species previously recorded for the project area was extracted from the POSA online database hosted by SANBI. The results indicate that 34 plant species have been recorded in the area queried, of which one was an endemic species, two have medicinal uses and four are exotic species. Of the 34 species previously recorded for the area, none are Species of Conservation Concern (SCC) in terms of their Red List status. Two species were listed for the project area in the Environmental Screening Tool Report:

- *Melolobium subspicatum* is listed as Vulnerable in the SANBI Red List. *M. subspicatum* is a rare and localized species endemic to Gauteng Province in South Africa. It grows exclusively in grassland on dolomite and is known from only three localities. Due to the current activities taking place on site, this species is unlikely to occur on most of the project footprint, but may have a low likelihood of occurrence in the eastern section of the project footprint.
- Sensitive species 1248 is indicated potentially occurring on the project footprint and is considered as having moderate sensitivity in the Screening Tool Report.

One flora species recorded on POSA for the area are listed as protected in the TNCO, i.e. *Orbea lutea.*

A desktop study was conducted to establish whether any potentially sensitive faunal species or species of conservation concern may possibly occur on site. The following faunal species that are of conservation concern were found during the desktop study:

- Mammals: ninety-three (93) mammal species were found to possibly occur, of which thirteen (13) are SCC, however these species are not likely to occur on the specific footprint since a large area of the proposed project footprint is currently utilised for mining and agricultural related land uses, but could still possibly utilise the wider region as part of their range.
- Avifaunal: 273 bird species are listed for the pentad in which the project area is located. Ten (10) avifaunal SCC have been indicated for the specific pentad relevant to the development. All of these birds are also listed in Schedule 2 of TNCO (Provincially protected game).
- Butterflies: 255 butterfly species are listed for the QDS in which the project area is located, all of which are categorized as Least Concern.
- Other Invertebrates: 53 species of Dung beetles, 45 Lacewing, 23 Odonata, 20 Spider and four Scorpion were recorded for the QDS, all not listed on the IUCN Red list. It should be noted that Baboon spiders and Burrowing scorpions are included in the ToPs list.
- Reptiles: 69 reptile species were recorded for the QDS. Two of the species have a national red listed status. All species of snakes are listed in Schedule 2 of the TNCO as Protected game.
- Amphibians: 14 amphibian species were listed, of which one is red listed.

A site visit was conducted on the 7th of April 2021.

The majority of the proposed project footprint is located on natural veld used for intensive livestock grazing. The Swartbooispruit River flows through the project centre site from south to north, with two farm dams in the river course. Four settling dams can be found to the

north-west of the project area. These dams are utilised by the current sand mining operation. Three of the settling dams are no longer in use and have been rehabilitated and revegetated.

The following broad classification of Vegetation Units (VU) were found to occur on the proposed project footprint:

1. Natural grassland (VU1);
2. Rehabilitated grassland (VU2);
3. Riparian zones (VU3);
4. Riparian vegetation of rehabilitated settling dams (VU4); and
5. Transformed areas (VU5).

Seventy-two (72) plant species were identified as occurring on the project footprint during the site survey. Of this number seven have medicinal uses and 20 are exotic, ten of which are categorised as AIP in terms NEMBA.

No protected plant species or SCC identified on the project footprint.

Thirty-eight (38) fauna species were encountered during the field assessment of which 17 species have a provincial conservation status as protected game, ordinary game or protected wild animals (such as the waterbirds sighted and all reptiles also enjoy protection). No species that have been found to occur has a national SCC status.

The study area contains the following biodiversity classes from the Gauteng Conservation Plan:

- CBA: Sections of the development footprint are located on areas categorised as CBA. The CBA areas are largely located on areas associated with the river and dams and areas which appear as secondary grassland, toward the centre of the footprint. These areas were most likely denoted as a CBA due to the appearance of the presence of habitat for red listed species, wetland / riparian conditions and natural grassland. Although the riparian areas (VU3 in this report) have been impacted and are moderately disturbed, the specialist does not dispute the designation of the areas categorised as CBA. However, it is the specialist's opinion that the grassland areas (VU1 in this report), adjacent to VU3, would more accurately fall within the description of ESAs.
- ESA: The eastern and western section of the project footprint have been categorised as ESA by the Gauteng Conservation Plan. These areas were most likely designated as ESA as they border CBA areas and may, at the time of the Gauteng Conservation Plan assessment, have had a more natural character and therefore acted as ecological support and buffers to the CBA areas. However, some of these areas have been transformed by recent mining activities VU4 and VU5 in this report), whilst others are used for intensive livestock grazing. It is, therefore, the specialist's opinion that VU4 and VU5, as described and delineated in this report, no longer fulfil the functions of ESAs, as they are contemplated in the Gauteng Conservation Plan.

A number of areas protected in terms of the NEMPAA are situated within 10 km west of the project footprint. The Crocodile River Doornrandje Nature Reserve Cluster is located 2.6 km west of the project area. The Vaal Grasslands NPAES area is situated 3.2 km west of the project footprint.

The western half of the project footprint is situated within the buffer zone of the Magaliesberg Biosphere, whilst the eastern half is situated within the transitional zone of the Magaliesberg Biosphere Reserve (MBR). The MBR is also indicated as an Important Bird Area.

The project footprint has been assigned the following sensitivity ratings in terms of terrestrial ecology aspects:

1. VU1 (indigenous grassland) is classified as having a Moderate sensitivity.
2. VU2 (rehabilitated grassland) is classified as having a Low sensitivity.
3. VU3 (riparian associated with Swartbooispruit) is considered High sensitivity.
4. VU4 (riparian associated with rehabilitated settling dam) is rated as having Low sensitivity.
5. VU5 (transformed areas) is classified as having a low sensitivity.

It is the opinion of the specialist that the development may continue if all mitigation measures are implemented and all areas of high sensitivity are avoided where feasibly possible. The wetland buffers as delineated and recommended by the wetland specialist should be sufficient in terms of also protecting ecological integrity.

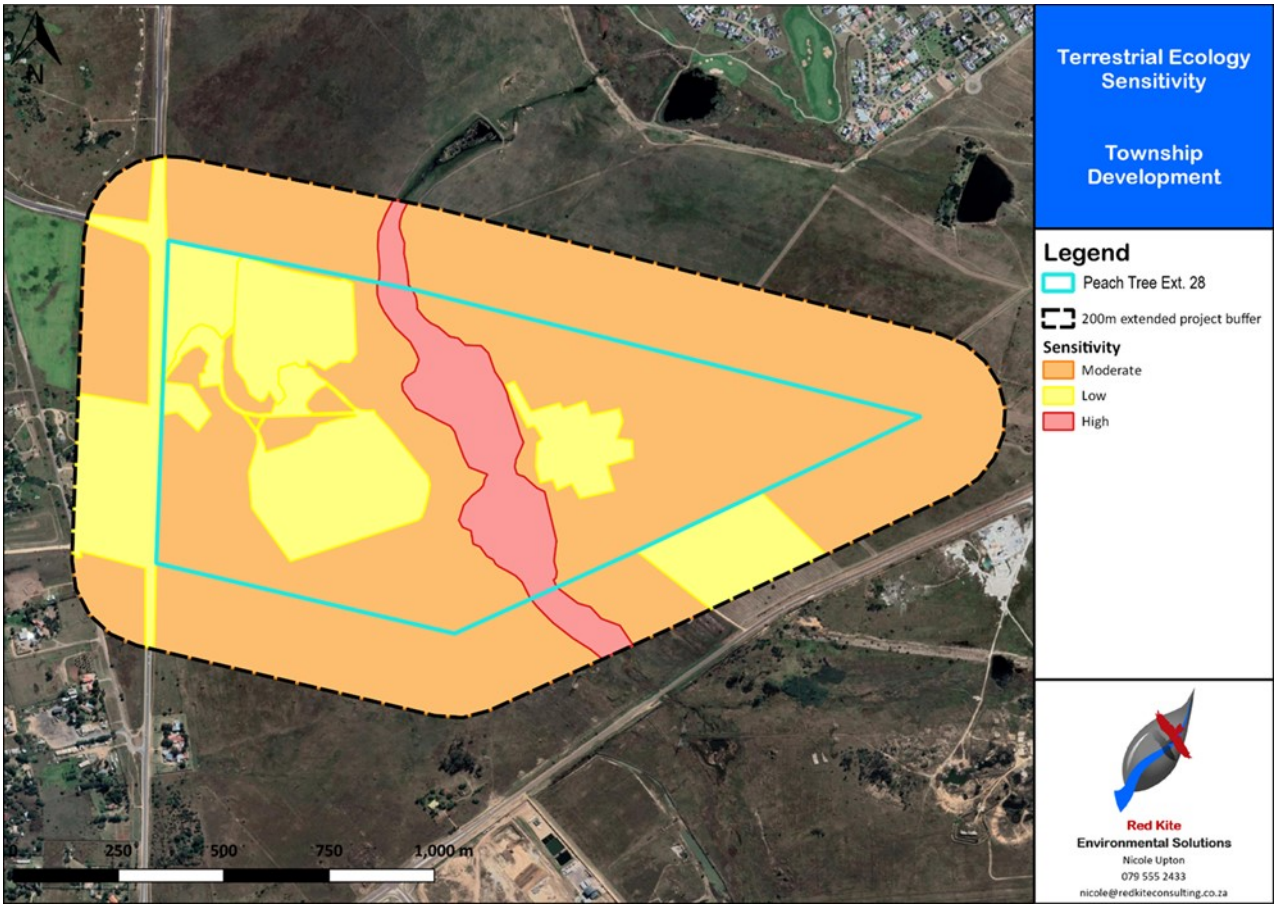

Figure 2: Ecological Sensitivity

Wetland Delineation and Functional Assessment Report, (June 2021)

According to the specialist wetland report (Elemental Sustainability (Pty) Ltd, 2021), a site visit was undertaken on the 16th of March 2021 to assess the present ecological status of the area and to determine the impacts, if any, on the receiving environment. A baseline ecological desktop assessment was undertaken of all available data. The farm falls within the Topographical Quarter Degree Squares of 2528CC. Google Earth images were studied in order to determine the position of possible wetlands and/or riparian zones in the study area. All possible wetlands were subsequently surveyed in order to determine the delineation thereof. The method described by the Department of Water Affairs and Forestry (DWAF, 2005) was followed in the delineation of the wetlands and riparian zones in the study area.

The site consists of cultivated fields, sand mining activities and cattle farming, with sections of grassland and bushveld scattered throughout the area. The Swartbooi Spruit traverses the site with two large instream dams. The study site falls within the Limpopo Water Management Area and is situated within Quaternary Catchment A21B. According to the National Wetland Map (NWM) (2018) database, the study area overlaps with one natural inland Channelled Valley-bottom wetland.

Following the results of the site assessment, one (1) wetland type was identified, namely Channelled Valley-bottom. The overall PES Category for the wetland is an E which means that the functionality has been Seriously Modified. The change in ecosystem processes and loss of natural habitat and biota is great, but some remaining natural habitat features are still recognizable. The loss of ecological integrity within the wetland may be attributed to the instream damming, change in hydrological functioning and the influx of alien vegetation. The results are summarised in the table below:

Classification	Scientific Buffer	PES	EIS	REC
Channelled Valley-bottom Wetland	65 m	E	Moderate	C

Gauteng Conservation Plan (2014)	The study site is classed as an Ecological Support Area (ESA), with all wetland features classed as Important Areas
NEMA Impact Assessment	The impacts associated with the activities range from Medium-High to Low prior to mitigation taking place. With mitigation fully implemented, the significance of most impacts can be reduced to Very Low or Low.
DWS Risk Assessment	All aspects of the activities fall within the Medium risk category. Therefore, a Water Use Licence is required.
Does the Specialist support the Application?	Based on the findings made in the report the impact can be mitigated to an acceptable level and the specialist can support the application if all mitigation measures provided in this report as well as general good practice, are strictly adhered to. • Any activities that take place within 500 meters of a wetland will require a Water Use Licence in terms of the National Water Act (Act 36 of 1998). • Site clearance should take place outside of the 65 m exclusion buffer zone. All existing infrastructure within the 65 m buffer area should be removed. Public open space and Low impact activities, including birding and hiking, can be allowed within the 65 m buffer. • A 32 m buffer area has been placed around the dam areas; all infrastructure should be placed outside of buffer lines.

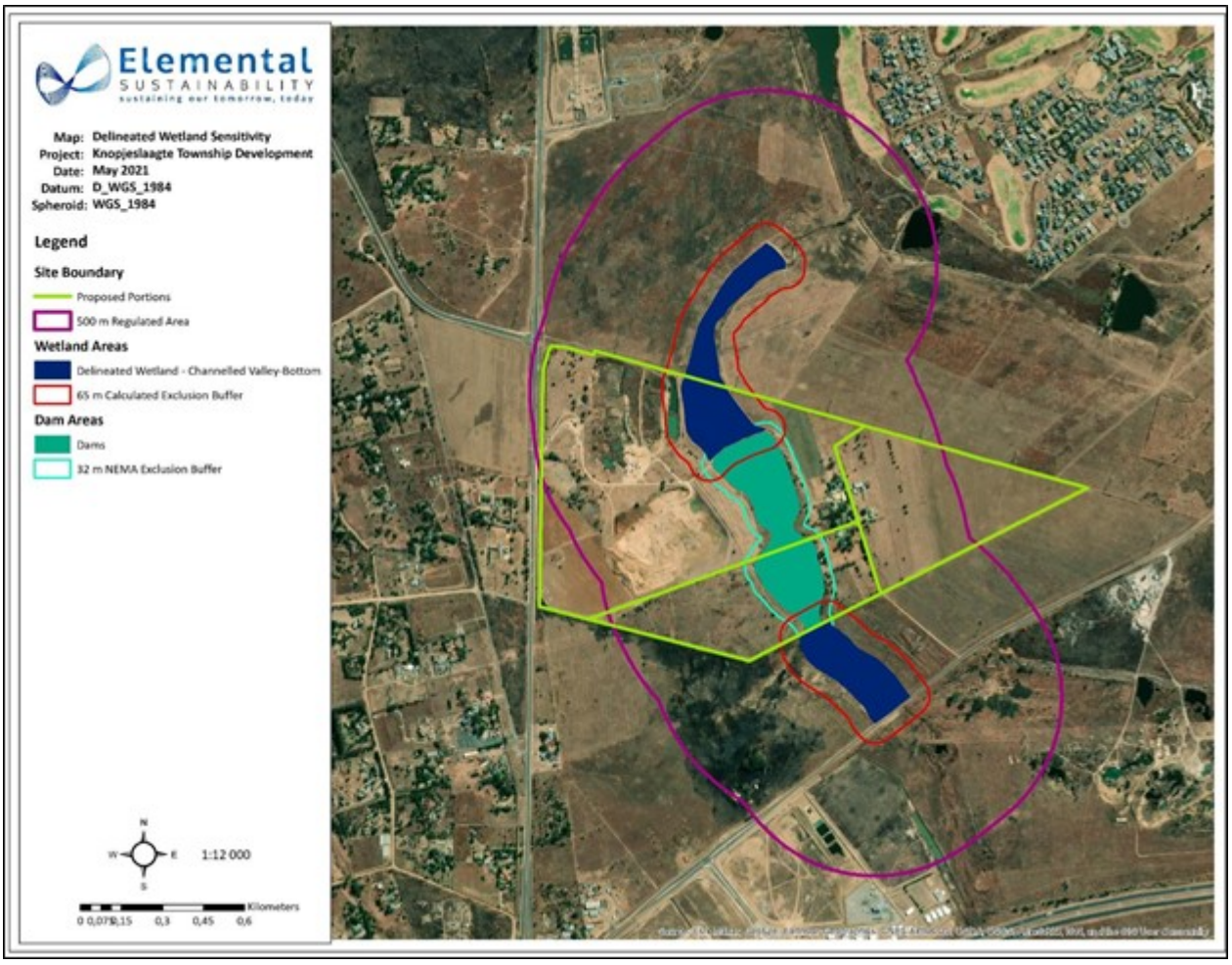

Figure 3: Wetland Delineated, Buffers and Sensitivity

Surface water and Aquatic Assessment (Red Kite Enviromental Solutions (Pty) Ltd, 2021)

Currently sand mining and associated activities are being undertaken on the western section of the project area. Run-off is directed away from the quarry in order to prevent flooding of the pit. Water is directed to the settling dams, this water is reused for wetting of roads and other exposed surfaces to prevent dust pollution as well as recycled to use in the washing process.

As part of the final land use planned for the mining right area, a township development is proposed.

The proposed township will consist of a total of 31 erven, just over 108 hectares, including residential, business, open spaces, private and public roads. The below diagram provides a depiction of the proposed layout.

The proposed township development project site falls within the Limpopo WMA. Major rivers in the WMA include the Limpopo River, Matlabas River, Mokolo River, Lephalala River, Mogalakwena River, Sand River and Nzhelele River. Many dams are present within the Limpopo WMA.

The proposed township development falls within the A21B quaternary catchment, and the A21 (Crocodile River) tertiary catchment. The primary river in for the tertiary catchment is the Jukskei River that converges and continues as the Crocodile River to the north-east. The Swartbooispruit River flows through the project site and drains into the Hennops River (secondary river) to the north, that in turn converges with the Crocodile to the west.

Apart from the above the Swartbooispruit perennial river (Section "C" watercourse), no other prominent perennial or non-perennial drainage lines are visible within the proposed development and extended buffer area. Two large farm dams are found in the Swartbooispruit watercourse, on the project site. Four settling dams can be found to the north-west of the project area. These dams are utilised by the current sand mining operation. Three of the settling dams are no longer in use and have been rehabilitated and revegetated.

The main receiving watercourse for potential surface water impacts, related to the proposed development, is the Swartbooispruit and from there the Hennops River. The watercourses draining the proposed project area, and greater surroundings have been significantly altered through infrastructure, development, agriculture, and multiple farm dams.

The PES and REC for the A21B quaternary catchment is D, largely modified, with the EIS yet to be determined by the DWS. A21B falls within the Water Resource Class III for IUA 1, indicating sustainable, minimal protection and high utilisation of the water resource.

Water quality data was benchmarked against the RWQO for the quaternary catchment A21B. All levels recorded fall within acceptable levels apart from the high number of *Escherichia coli* (*E. coli*) counts per 100 ml. These results will form the baseline for future monitoring results.

The current classes as per Biomonitoring are as follows:

- US 1: Point should be sampled during future sampling events. This point could be feasible for SASS at a later stage during the High flow season when more water is present in the watercourses.
- DS 1: Class C – Moderately Modified, condition above the PES reference score for the Reach, which match the 1999 PES Condition for the main river, however, this class was scored as Class E in the 2018 National Biodiversity Assessment, indicating a drop in ecological condition within the area.

A 20 m buffer is recommended for the Swartbooispruit and associated in-stream dams in regard to the proposed development.

The primary aquatic ecology and surface water impacts associated with the proposed project are the potential impacts on water quality, habitat and biota degradation due to domestic waste, sedimentation, wastewater discharges, flow quantity and velocity alterations during the construction phase and continued operation.

It is important that the project aim to limit impacts on the aquatic resources as far as possible in order to maintain its current basic ecosystem functions. All activities should aim at improving and maintaining the health class of the affected streams to a Class D.

It is the opinion of the specialist that the development may continue without severe ecological impacts in terms of the surface water environment identified in the framework of the study. Management of impacts should be initiated from the onset of the project. All management features as set out in this report, the EMPr and the wetland assessment should also be adhered to.

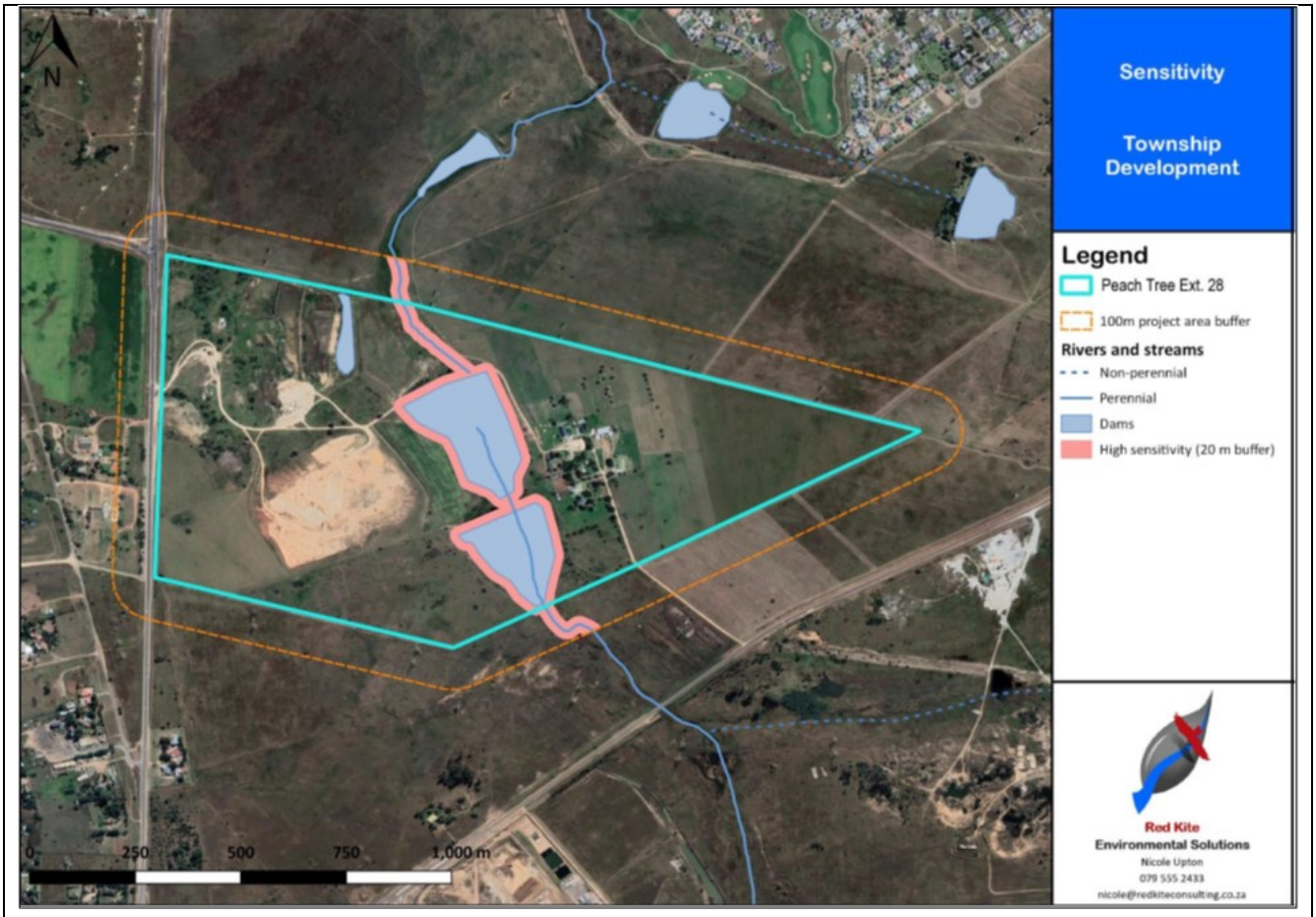

Figure 4: Surface water and Aquatic Sensitivity

Heritage Assessment (June 2021)

According to the specialist heritage report (Coetzee, T, May 2021), one cemetery (B07), four demolished sites (B01, B03, B05, B06), one contemporary site (B08) and two altered and potentially historic buildings (B04) were located.

Demolished sites B01, B03 and B05 are located on Portions 814 and 816 and might be associated with subsurface culturally significant material. Care should be exercised during the construction phase of the project when developing within the demarcated boundaries of these sites.

Site B02, a disused mine/quarry, was identified on historical topographical maps and recorded via photographic record. The site is not regarded as significant from a cultural perspective.

Two of the buildings located at the main residence (Site B04) might exceed 60 years of age. However, these buildings have significantly been altered in more recent times. The cultural significance of these buildings are therefore considered to be low.

Site B07, a cemetery that is no longer in use, might be impacted by the proposed township development. Therefore, the following recommendations are made: A fenced-off conservation buffer of 30 m, a plaque indicating the presence of the cemetery, as well as monitoring by the Environmental Control Officer (ECO) during the construction phase. Alternatively, the graves may be relocated by a professional graves relocation unit.

Site B08, a windpump with associated cement structure, as well the remaining contemporary buildings associated with the study area are of recent origin and are not significant from a cultural perspective.

Subject to adherence to the recommendations and approval by SAHRA (South African Heritage Resources Agency), the proposed Peachtree Ext 28 Township Development as per the indicated boundary may continue. Should skeletal remains be exposed during development and construction phases, all activities must be suspended, and the relevant heritage resources authority contacted (See National Heritage and Resources Act, 25 of 1999 section 36 (6)). Also, should culturally significant material be discovered during the course of the said development, all activities must be suspended pending further investigation by a qualified archaeologist.

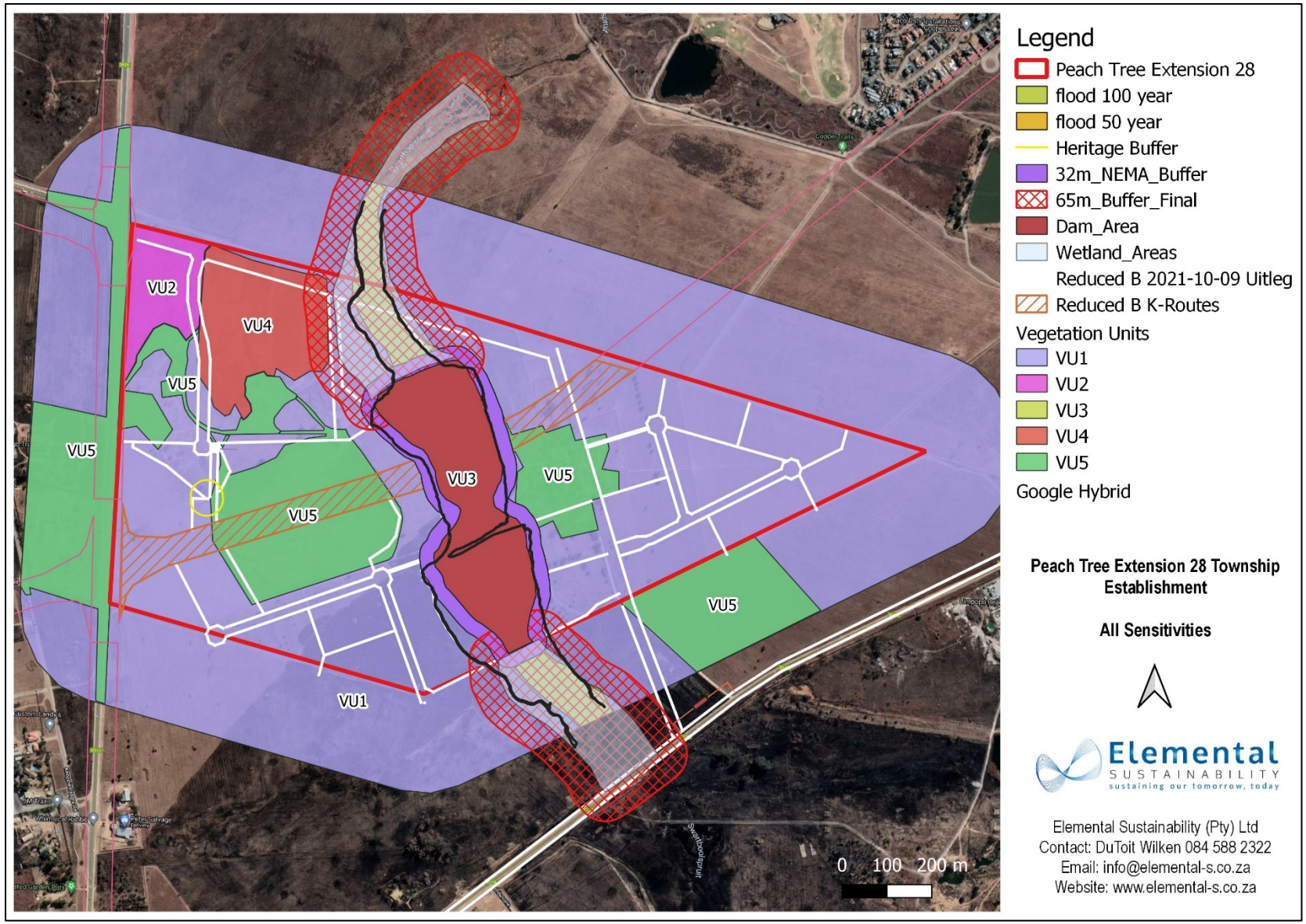

Figure 5: All Environmental Features with Site Layout

Paleontological Assessment (April 2021)

In my capacity as a professional palaeontologist, I am requesting exemption for palaeontological impact assessment in terms of the National Heritage Resources Act (Act 25 of 1999) and the National Environmental Management Act (Act 107 of 1998) which requires that the proposed development must be preceded by the relevant impact assessment, in this case for palaeontology.

The proposed construction of a residential township and associated amenities on the Kilo Sands property that has been greatly disturbed, and partially reclaimed, is on ancient granite-gneiss rocks of the Archaean Granitoids that are about 3340-million-year-old. These rocks forming the Johannesburg Dome are part of the Kaapvaal Craton and represent some of the oldest crustal rocks in the world (Robb et al., 2006). Such rocks are volcanic in origin, have been partly metamorphosed (ibid). There is no chance at all of any fossils being preserved in these rocks, and this is confirmed by the grey colour (insignificant to zero) in the SAHRIS palaeosensitivity map.

Therefore, we request that no palaeontological impact be required, and that as far as the palaeontology is concerned, the proposed project may proceed.

Traffic Impact Assessment (Town Planner Engineering Studies) (EDL Consulting Engineers (Pty) Ltd, September 2021)

Several private roads are proposed since it is a township development, and a large public road reserve (12.5 hectares) also falls within the site.

A formal Traffic Engineering Assessment (EDL Consulting Engineers (Pty) Ltd, September 2021) had been undertaken and the following findings are provided:

Based on the content of this Traffic Impact Assessment report, the following key conclusions and recommendations are relevant:

- Traffic counts were undertaken in May of 2021, at the five (5) key intersections as requested by the City of Tshwane Metropolitan Municipality, as also mentioned in Chapter 3.
- It is estimated that the proposed development will generate approx. 2414vph trips (total In' plus 'Out') during the Weekday morning (AM) and 3033vph trips (total 'In' plus 'Out') during the Weekday afternoon (PM) peak hours.
- Latent Rights included Peach Tree X15& 16 and also Peach Tree X21-25. Implemented rights (already built and occupied) were subtracted from the latent rights traffic.
- SIDRA 9™ Intersection Capacity Analyses were undertaken and were carried out for the peak periods at the key intersections and as per Chapter 8, several upgrades are proposed for the following intersections:
    - M26 & R511
    - M26 & R114
    - R114 & Boundary Road
    - R114 & Southern Access Road.
- Regarding public transport, formal facilities are available at the proposed northern access at the intersection of the M26 & R511. Formal facilities are proposed at the proposed Southern Access at the R114 intersection.
- A 1.8m wide paved walkway is proposed between any public transport facilities and the nearest pedestrian gate to the development.

It is therefore recommended that the proposed development situated on Portions 814, 815 and 816 (Portions of Portion 19) of the Farm Knopjeslaagte 385-JR is supported from a traffic engineering perspective, provided that the intersection and road upgrades, as well as the accesses, as proposed in this report be implemented as set out on the attached drawings and to the relevant standards of the Tshwane Metropolitan Municipality and Gautrans.

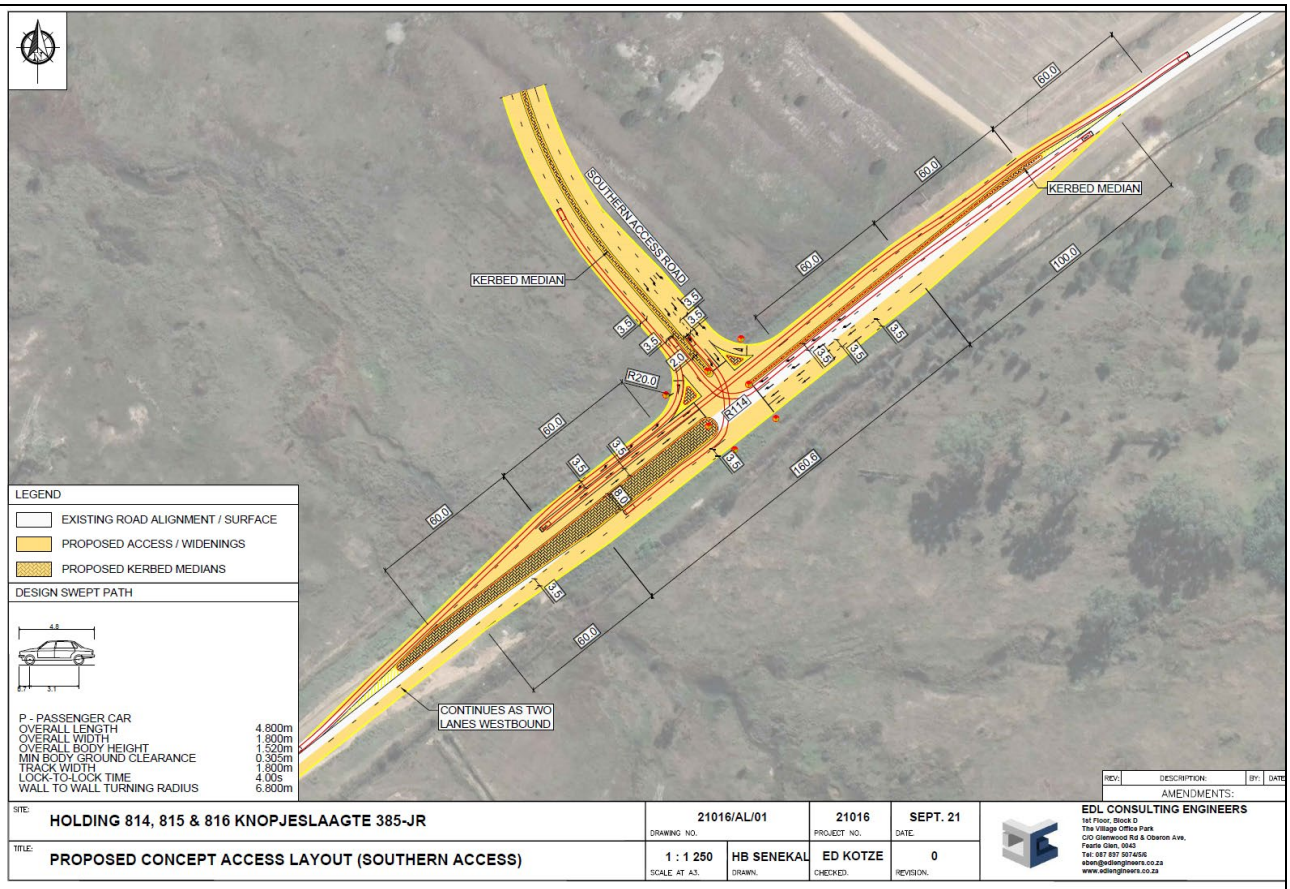

Figure 6: Southern Access Upgrades

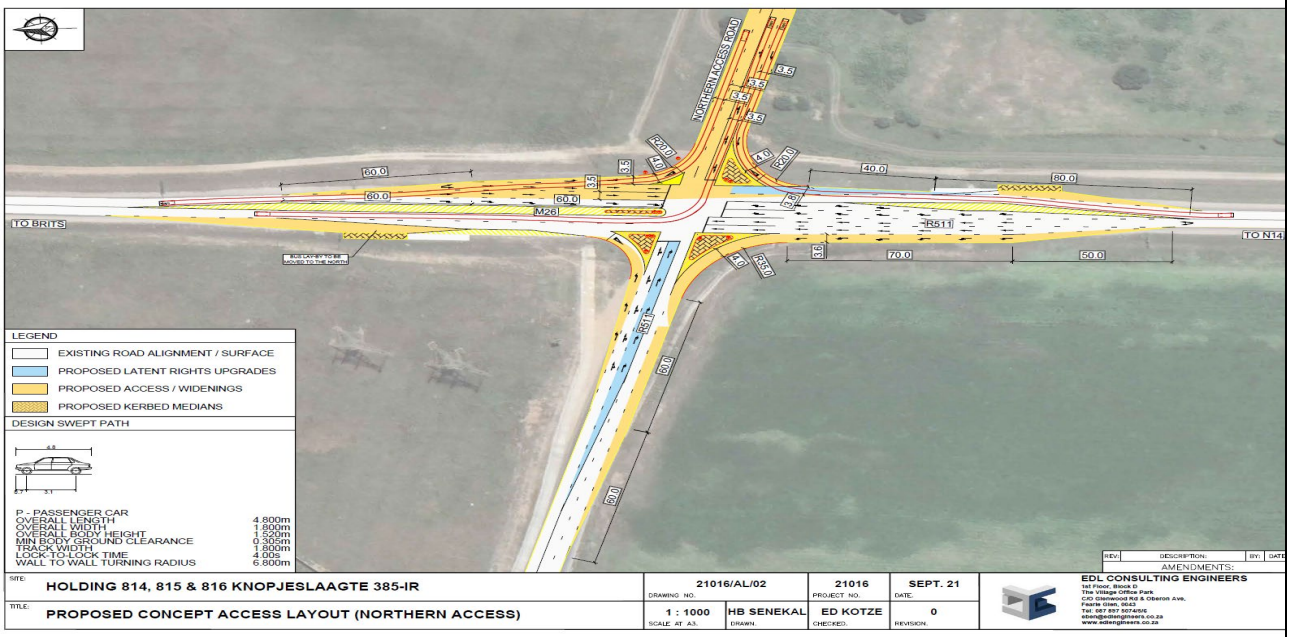

Figure 7: Northern Access Upgrades

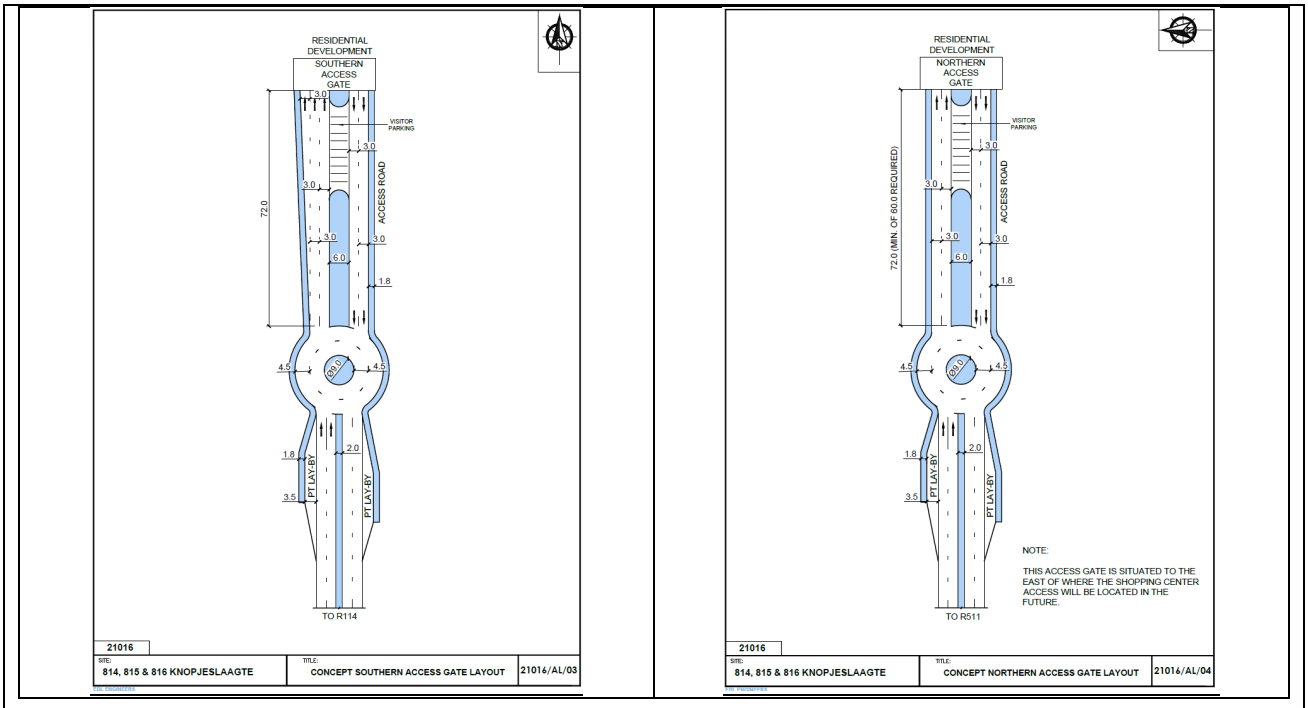

Figure 8: Concept Southern and Northern Gate Layout

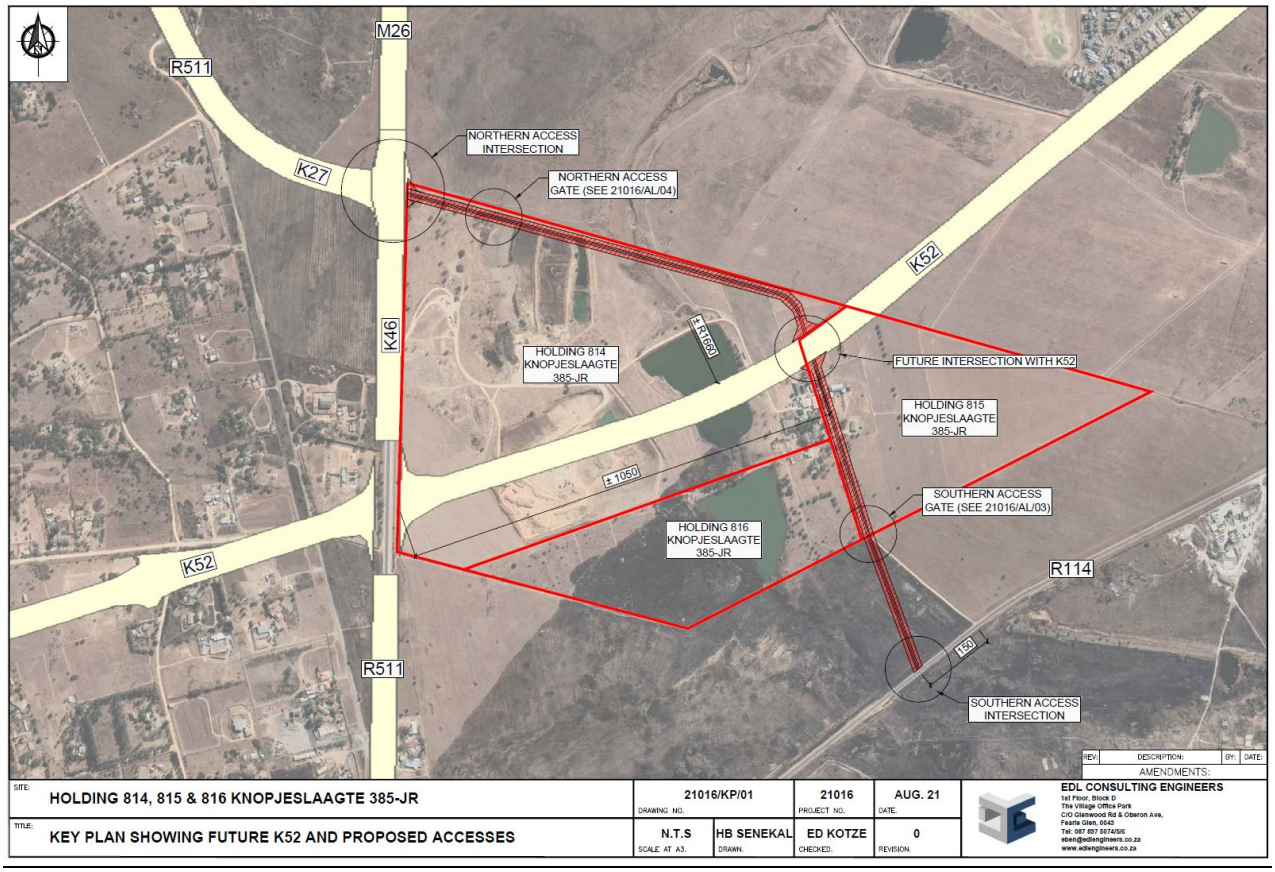

Figure 9: Key Plan Showing Future K52 and Proposed Accesses

These Engineering Services Report had been conducted by CivilConsult Consulting Engineers (CivilConsult Consulting Engineers (Pty) Ltd, 2021).

Refer to SECTION D IN THE DRAFT BAR

6. ENVIRONMENTAL MANAGEMENT AND IMPLEMENTATION PROGRAMME

As part of environmental management and enhancement, an identification and description of impact management objectives must be developed, inclusive of the proposed methods and effective management and mitigation measures required during the design, construction and operational phases of the proposed township development. The tables below list potential impacts and mitigation measures recommended for the proposed Peach Tree Ext 28 Township development at the different phases.

Table 5: Design, Planning and Construction Phase Impact management plan for the proposed Peach Ext 28 Township Development

Potential Impact	Monitoring Compliance & Reporting / Mitigation Type	Management And Mitigation Measures	Management Outcome / Objectives	Functional Requirements for Monitoring	Monitoring And Reporting Frequency	Responsibility
Contamination of soil from leaks/spillages of hydrocarbons from machinery used during construction phase.	Visual inspection/confirmation that no surface impacts are occurring. Management and Rehabilitation (If required) specifically for erosion	• Monitor general condition of surface. rehabilitate if any surface impact occurs. • The approved storm water management plan must be implemented as per approved layout and confirmed whether municipal services will be available or alternatively it should be included in the WUL Application to be launched. • Contaminated soil to be removed and transported to a facility for remediation. • Drip trays to be used for vehicles that stand overnight during construction of erven/buidlings. • Topsoil to be adequately stockpiled on site and protected from contamination and protected from the wind. Ensure erosion is prevented and immediately repaired, specifically areas associated with the Swartbooispruit.	Early detection and prevention of possible impacts.	Monitoring of the condition of the surface areas and where activities are taking place - Visual inspection	Monthly, Visual	ECO, Site Manager
Contamination/Pollution of groundwater from leaks/spillages of either hydrocarbons, waste or waste water as a result of construction activities.	Remedy through rehabilitation, proper removal and disposal if soils have become contaminated	• All vehicles and machinery will be regularly serviced to ensure they are in proper working condition and to reduce risk of leaks. • All leaks will be cleaned up immediately using an absorbent material and spill kits, in the prescribed manner. • The approved Integrated Water and Waste Management Plan to be implemented (when the WUL has been authorised). <u>Hydrocarbons and hazardous waste:</u> • All hazardous waste generated shall be kept separate and shall not be mixed with general waste.	Prevention of soil and water pollution.	Implement IWWMP Monitoring prescribed	As needed	ECO, Site Manager
Contamination/Pollution of surface water from leaks/spillages of either hydrocarbons, waste or waste water as a result of construction activities	Visual inspection/confirmation that no additional surface impacts are occurring. Management and		Prevention of soil and water pollution.	Implement IWWMP • During the construction phase, monthly water quality monitoring will be required and bi-annual biomonitoring.	As per WUL to be applied for	ECO, Site Manager

Potential Impact	Monitoring Compliance & Reporting / Mitigation Type	Management And Mitigation Measures	Management Outcome / Objectives	Functional Requirements for Monitoring	Monitoring And Reporting Frequency	Responsibility
	Rehabilitation (If required)	• All hazardous waste shall be stored within a sealed drum on an impermeable surfaced area within the central waste storage and transition area. • Ensure that any rubbish generated during construction as well as from employees (litter) is regularly cleared from the site, in particular from streams (Swartbooispruit) and wetlands. • Cement batching boards should be used and cement-based products/wash not to be disposed of into the natural environment. • Sanitation – portable toilets (1 toilet per 30 users is the norm) to be provided where construction is occurring. Workers need to be encouraged to use these facilities and not the natural environment. Waste from chemical toilets should be disposed of regularly and in a responsible manner by a registered waste contractor.		• Monitoring Points: 1.Kilo Sand US 25°53'55.13"S, 28° 2'21.84"E Swartbooispruit upstream point, south of the project area 2.Kilo Sand DS 25°53'21.06"S, 28° 2'0.05"E Swartbooispruit downstream point, north of the project area. The monthly surface water monitoring samples should be analysed for the following parameters (unless specified by WUL when issued): • pH • Electrical Conductivity • Turbidity • Sulphate • Nitrate • Nitrite • Dissolved Oxygen • E. coli • Free and Saline Ammonia		
Increased flooding and runoff due to soil compaction and impacts on surface water or riparian areas	Storm water Management, Monitoring, Infrastructure Design	• Ensure the effective operation of the storm water management system through continuous maintenance. • Construction and maintenance of permeable surfaces to permit infiltration into groundwater, reducing runoff volume and velocity.	Prevention water pollution and impacts on the natural environment and surrounding water users.	Refer above unless stated otherwise in approved IWWMP	As per WUL to be applied for	ECO, Site Manager

Potential Impact	Monitoring Compliance & Reporting / Mitigation Type	Management And Mitigation Measures	Management Outcome / Objectives	Functional Requirements for Monitoring	Monitoring And Reporting Frequency	Responsibility
		• Implement erosion prevention measures and structures. The soil around the storm water outlets should be vegetated with grass to reduce erosion. • Ensure proper disposal of domestic waste and continuous clearing of litter across the development area. • Ensure sanitation infrastructure is properly maintained and malfunctions are promptly identified and remediated. • Removal of alien and invasive species must continue for a two-year maintenance period after development, on a biannual basis. • Ongoing implementation of the recommended monitoring plan to ensure that impacts to the surface water environment are detected timeously. • Corridor movement associated with water resources should not be hampered by the development. No sections of the river should be cordoned off. Loss of stream continuity should be prevented through ensuring that no obstructions of natural stream flow patterns occur. • Concurrent rehabilitation to be implemented, specifically revegetation of areas disturbed. All bare and exposed soils noted during a two-year maintenance period, including areas where alien vegetation is periodically removed, must be reseeded using the specified indigenous species recommended. • Upon completion of construction works within riparian zones, the ECO or a suitably qualified specialist should continue to monitor the rehabilitation works for three months on a monthly basis. Thereafter, one monitoring site visit is recommended after 6 months from completion of the works and final sign-off of rehabilitation works should take place after one year. • Bridges and culverts should be regularly inspected to ensure that no blockages occur.				

Potential Impact	Monitoring Compliance & Reporting / Mitigation Type	Management And Mitigation Measures	Management Outcome / Objectives	Functional Requirements for Monitoring	Monitoring And Reporting Frequency	Responsibility
Siltation/Sedimentation in storm water pipelines	Stormwater Management, Monitoring, Infrastructure Design	• Reduce the disturbance generated by construction vehicles on site, reducing dust emissions. • Adequate levelling and compaction during construction activities so to reduce the wind blow pollution. • Adequate stockpiling of topsoil removed during excavations, away from prevalent winds and high gradient slopes. • Sedimentation control devices, such as berms, must be temporarily installed in order to prevent sedimentation.	Prevent Discharge to the environment	Refer above unless stated otherwise in approved IWWMP	As per WUL to be applied for	ECO, Site Manager
Impacts to wetlands - Channelled Valley Bottom associated with Swartbooispruit	Visual inspection/confirmation that no additional surface impacts are occurring. Management and Rehabilitation (If required)	• Any activities that take place within 500 meters of a wetland will require a Water Use Licence in terms of the National Water Act (Act 36 of 1998), however as far as possible, site clearance should take place outside of the exclusion buffer zone. Public open space and Low impact activities, including birding and hiking, can be allowed within the buffer. • Demarcate the wetland areas and buffer zones to limit disturbance, clearly mark these areas as no-go areas. • Ensure that erosion management and sediment controls are strictly implemented from the beginning of site clearing activities. • All areas should be re-sloped and top-soiled where necessary and reseeded with indigenous grasses to stabilise the loose material. • Monitor the occurrence of erosion during the rainy season and take immediate corrective action where needed. • Alien and invasive vegetation control should take place throughout all phases to prevent loss of floral habitat. • Monitor the occurrence of erosion during the rainy season and take immediate corrective action where needed. • The duration of impacts on the wetland systems should be minimised as far as possible by ensuring	Prevention of soil and water pollution.	Monitoring of the condition of other portions in the MR (which should not suffer any surface impacts)	As per WUL to be applied for	ECO, Site Manager

Potential Impact	Monitoring Compliance & Reporting / Mitigation Type	Management And Mitigation Measures	Management Outcome / Objectives	Functional Requirements for Monitoring	Monitoring And Reporting Frequency	Responsibility
		that the duration of time in which flow alteration and sedimentation will take place is minimised. • Buffer zones should be maintained, in order to minimise sedimentation of the downstream areas. • Ensure that erosion management and sediment controls are strictly implemented from the beginning of site clearing activities. • All areas should be re-sloped and top-soiled where necessary and reseeded with indigenous grasses to stabilise the loose material. • Erosion control measures, such as berms, must be implemented to manage runoff from roads to prevent erosion and sediment runoff. • Rehabilitation of disturbed areas as a result of construction must be implemented immediately upon completion of construction. • Littering must be prevented by effective site management and the provision of bins. • Effective storm water management should be implemented to avoid runoff to the wetland. • Site clearing to take place in a phased manner (where possible) to allow for any faunal species present to move away from the study site to the surrounding open space areas. • Prior and during vegetation clearance any larger fauna species noted should be given the opportunity to move away from the construction machinery. • Fauna species such as frogs and reptiles that have not moved away should be carefully and safely removed to a suitable location beyond the extent of the development footprint by a suitably qualified ECO trained in the handling and relocation of animals. • Waste management must be a priority and all waste must be collected and stored adequately. It is recommended that all waste be removed from site on a weekly basis to prevent rodents and pests entering the site.				

Potential Impact	Monitoring Compliance & Reporting / Mitigation Type	Management And Mitigation Measures	Management Outcome / Objectives	Functional Requirements for Monitoring	Monitoring And Reporting Frequency	Responsibility
		• Should any sensitive or Red Data animal or bird species be encountered during the construction, and operation activities, these should be relocated to natural areas in the vicinity. • No hunting, trapping or killing of fauna are allowed. • Any lizards, snakes or monitors encountered should be allowed to escape to a suitable habitat away from disturbance. General avoidance of snakes is the best policy if encountered. Snakes should not be intentionally harmed or killed and allowed free movement away from the area. • Trenches and deep excavations should not be left open for extended periods of time as fauna may fall in and become trapped in them. Trenches which are exposed should contain soil ramps allowing fauna to escape the trench. • Noise must be kept to an absolute minimum at night to minimise all possible disturbances to amphibian species and nocturnal mammals.				
Soil Erosion and sedimentation of water resources as a result of construction activities	Stormwater Management, Monitoring, Infrastructure Design	• Do not develop in the delineated floodline • Adhere to WUL issued and approved IWWMP • In accordance with Government Notice 704 (GN 704), the onsite management should: • Keep clean and dirty water separated; • Contain any dirty water within a system; and • Prevent the contamination of clean water. • All temporary storm water infrastructure (if any) on-site shall be maintained and kept clean throughout the construction period; • Any contaminated material is disposed of in an appropriate manner and the potential risks associated with such spills are limited; • All hazardous substances should be stored on impervious surfaces that allow for the containment of spills and leakages (e.g. bunded areas). Should spills occur, these should be reported to the Site Manager.	Prevention water pollution and impacts on the natural environment and surrounding water users.	Implement IWWMP Monitoring prescribed	As per WUL to be applied for	ECO, Site Manager

Potential Impact	Monitoring Compliance & Reporting / Mitigation Type	Management And Mitigation Measures	Management Outcome / Objectives	Functional Requirements for Monitoring	Monitoring And Reporting Frequency	Responsibility
		• Adequate levelling and compaction during construction activities.				
Increased noise generation from construction activities.	Control through management and communication	• Limit the amount of construction vehicles on site. • Maintain construction vehicles and machinery in good working order to reduce the noise on site. • Equipment should be fitted with noise reduction devices.	Ensure noise are kept in acceptable levels	Ensure Noise do not reach unacceptable levels	As needed	ECO, Site Manager
Increased air emissions/dust from construction activities.	Control through management and prevention of dust	• No clearance of indigenous vegetation in the buffer zone will be allowed or within the riparian and wetlands buffers delineated. • The unnecessary clearance of indigenous vegetation should be avoided as far as possible. • Construction activities should be restricted to the immediate area of development. • Control the amount of construction vehicles on site. • Exposed soil must be dampened and or covered to prevent wind action from causing dust plumes. • Machinery and vehicles must be in good working conditions so as to emit minimal air pollution.	Ensure air quality levels and dust emissions are kept in acceptable levels	Ensure Dust/Air Quality impacts do not reach unacceptable levels	Annually	ECO, Site Manager
Loss of vegetation as a result of site clearance	Infrastructure designs; Management; Monitoring	• An appointed Environmental Control Officer (ECO) must always be available to ensure implementation of the recommended mitigation/management measures during the construction of the project. - The ECO is to be on site twice a month – once for a site visit or project progress meeting and once for auditing. These visits must be two weeks apart. - The ECO must be able to make recommendations on the ground as the project unfolds and possible new aspects arise. - The ECO must ensure that all activities comply with the relevant mitigation measures, authorisations and management plans. - The ECO must identify any potential risks from the project on the terrestrial ecology aspects.	Prevention water pollution and impacts on the natural environment and surrounding water users.	Ecological Monitoring and Compliance	Monitoring should start as soon as the construction phase of the development commences. The monitoring should include the following: • Removal of alien and invasive species must continue for a two-year maintenance period after development, on a biannual basis. • Implement an Observe and Report approach which will enable employees/residents to report any disturbance of fauna or degradation that	ECO, Site Manager

Potential Impact	Monitoring Compliance & Reporting / Mitigation Type	Management And Mitigation Measures	Management Outcome / Objectives	Functional Requirements for Monitoring	Monitoring And Reporting Frequency	Responsibility
		- The ECO must enforce the protection and conservation of terrestrial ecology from any impacts. • Remove the invasive Category 1, 2 and 3 species. • Limit the removal of vegetation to the construction footprint. Remove all invasive species on site. • Ensure employees have been educated in minimizing environmental impacts. • Avoid indigenous vegetation where possible. • No SCC or protected species were identified as occurring or likely to occur on the project footprint. However, should SCC or protected species be found to occur on the development footprint relevant authorisations must be obtained, in terms of NEMBA (ToPS List), the TNCO and the National Forests Act, 1998 (Act No. 84 of 1998).			they encounter during the operational phase.	
Impacts to Faunal species within and surrounding landscape	Storm water Management, Monitoring, Infrastructure Design	• Where rare fauna (vertebrate and invertebrate) stands to be lost, every effort should be made to minimise the impact. • Prohibit / control access to portions of the property that is to remain undeveloped; and ensure that animals are not impacted on (e.g., illegal poaching). • Clear the site in a logical sequence and manner that allows mobile species to escape. • Maintain any habitat corridors effectively. • No SCC or protected species were identified as occurring or likely to occur on the project footprint. However, should SCC or protected species be found to occur on the development footprint relevant authorisations must be obtained, in terms of NEMBA (ToPS List), the TNCO and the National Forests Act, 1998 (Act No. 84 of 1998). • Since many birds have been flagged as a possible occurrence in the area and the area falls within an Important Birding Area, the electrical infrastructure which normally forms part of a residential development, should investigate the use of insulators to be placed on conductors to prevent the	Prevention water pollution and impacts on the natural environment and surrounding water users.	Ecological Monitoring and Compliance	Monitoring should start as soon as the construction phase of the development commences. The monitoring should include the following: • Removal of alien and invasive species must continue for a two-year maintenance period after development, on a biannual basis. • Implement an Observe and Report approach which will enable employees/residents to report any disturbance of fauna or degradation that they encounter during the operational phase.	ECO, Site Manager

Potential Impact	Monitoring Compliance & Reporting / Mitigation Type	Management And Mitigation Measures	Management Outcome / Objectives	Functional Requirements for Monitoring	Monitoring And Reporting Frequency	Responsibility
		bird from touching the conductor while landing or taking off and thus reducing the risk of an electric shock. The length of the isolators is adapted to the size of large birds of prey. Popular mitigation measures (Dixon, 2017) include: - Methods for mitigation: Insulation - Methods for mitigation: Perch deterrents and deflectors. - Methods for mitigation: Reconfiguration (Preferred) - Prevention: Ensure all new power infrastructure is bird safe (Preferred) - Refer to Ecological Report on details on these methods.				
Impacts on Heritage sites identified	Monitoring of water levels and possible impacts on the aquifer	• Site B07, a cemetery that is no longer in use, might be impacted by the proposed township development. Therefore, the following recommendations are made: A fenced-off conservation buffer of 30 m, a plaque indicating the presence of the cemetery, as well as monitoring by the Environmental Control Officer (ECO) during the construction phase. • Alternatively, the graves may be relocated by a professional graves relocation unit. • Should skeletal remains be exposed during development and construction phases, all activities must be suspended, and the relevant heritage resources authority contacted (See National Heritage and Resources Act, 25 of 1999 section 36 (6)). • Also, should culturally significant material be discovered during the course of the said development, all activities must be suspended pending further investigation by a qualified Archaeologist.	Prevention decreasing water availability and impacts on the natural environment and surrounding water users.	No impacts on Heritage Resources	Should culturally significant material be discovered during the course of the said development, all activities must be suspended pending further investigation by a qualified Archaeologist. A cemetery that is no longer in use must be fenced-off conservation buffer of 30 m, a plaque indicating the presence of the cemetery, as well as monitoring by the Environmental Control Officer (ECO) during the construction phase	ECO, Site Manager
Potential visual impact on the viewpoints	Monitoring and Rehabilitation if required	• The area will be rehabilitated after construction is concluded and thus the visual impact will be mitigated. In addition, the following measures are recommended:	Early detection and prevention of possible impacts.	Monitor general condition and implement good housekeeping	Monitor good housekeeping monthly, visual improvements and rehabilitation success possible quarterly.	ECO, Site Manager

Potential Impact	Monitoring Compliance & Reporting / Mitigation Type	Management And Mitigation Measures	Management Outcome / Objectives	Functional Requirements for Monitoring	Monitoring And Reporting Frequency	Responsibility
		• Plant some indigenous trees to create a barrier between the neighbours and roads • Prevent visible dust clouds during construction and ensure dust is kept to a minimum.				
Generation and disposal of general waste, litter and hazardous material during the construction and operational phase	Environmental Awareness, Monitor waste	• Ensure enough bins are provided during the construction phase and enough bins are permanently made available during operation throughout the township development area. • Restrict access to the riverine and wetland system to prevent waste being dumped into the surface water environment. • Waste should be collected and disposed of at a licensed waste facility. • Identify disposal sites for the various categories of waste likely to be generated on site. • Make sure general cleanliness on site. • Reduce, recycling and reuse of waste must occur whenever possible. • Recycling bins must be separate and clearly marked according to material. • Waste must be stored safely away from employees' and residents' exposure. • Construction debris is not to be buried on site. • No burning of waste will occur on site, unless to remove alien seeds from storage sites.	Responsible waste management and prevention of pollution.	Monitor volumes of waste disposed/ generated and volumes removed by Contractors	Monthly Disposal and Quantities disposed	ECO, Site Manager
Need for services e.g. water, electricity and sewerage systems, causing additional strain on natural resources and service infrastructure.	Infrastructure designs; Management; Monitoring	• Energy savings measures to be implemented, e.g.: no lights to be switched on unnecessarily. Only security lights to be switched on at night. • Energy saving bulbs to be installed where installations is required by the applicant. • Sewerage system should be managed in accordance with WUL and services regularly by a suitably qualified Contractor (if not municipal managed and serviced). • Water saving taps could be installed in the houses and outside houses (in gardens) if possible by the applicant.	Minimise and manage service requirements	Energy and water saving initiatives	Continuous	ECO, Site Manager

Potential Impact	Monitoring Compliance & Reporting / Mitigation Type	Management And Mitigation Measures	Management Outcome / Objectives	Functional Requirements for Monitoring	Monitoring And Reporting Frequency	Responsibility
The change in the traffic patterns as a result of increased traffic entering and exiting the specific area (Knopjeslaagte)	Infrastructure designs; Management; Monitoring	• Heavy vehicles should adhere to the speed limit of the road. • Ensure roads can handle the amount of traffic expected. It is known that the density of the township had already been decreased based on the findings of the traffic assessment conducted by the town planners.	Traffic Control and prevention of impacts	As per Traffic Management Plan	As per Traffic Management Plan	ECO, Site Manager
Nuisance, health and safety risks caused by increased traffic on an adjacent to the study area including cars and heavy vehicles.	Infrastructure designs; Management; Monitoring	• Drivers will be enforced to keep to set speed limits. • Roads and intersections will be signposted clearly. • Vehicles should adhere to the speed limit of the road. • All traffic accommodation measures are to conform to the latest edition of the South African Road Signs Manual.	Traffic Control and prevention of impacts	As per Traffic Management Plan	As per Traffic Management Plan	ECO, Site Manager
Increased job opportunities	Appoint local service providers	• Meet the requirements of the government policies for procurement and employment, as are applicable to local government, to take care of and avoid potential conflict between people in the immediate surroundings seeking employment and those from elsewhere.	Prevent and/or remediate ecological impacts	N/A	N/A	ECO, Site Manager

Table 6: Operational Impact management plan for the proposed Peach Tree Ext 28 Township Development

Potential Impact	Monitoring Compliance & Reporting / Mitigation Type	Management And Mitigation Measures	Management Outcome / Objectives	Functional Requirements for Monitoring	Monitoring And Reporting Frequency	Responsibility
Erosion and loss of soil	Visual inspection/confirmation that no surface impacts are occurring. Management and Rehabilitation (If required) specifically for erosion	• Monitor general condition of surface, rehabilitate if any surface impact occurs. The approved storm water management plan must be implemented (could be municipal managed or should otherwise be included in the WUL issued); • Contaminated soil to be removed and transported to a facility for remediation. • Ensure erosion is prevented and immediately	Early detection and prevention of possible impacts.	Monitoring of the condition of the surface areas and where activities are taking place - Visual inspection	Monthly, Visual	ECO, Site Manager

Potential Impact	Monitoring Compliance & Reporting / Mitigation Type	Management And Mitigation Measures	Management Outcome / Objectives	Functional Requirements for Monitoring	Monitoring And Reporting Frequency	Responsibility
		repaired, specifically areas associated with the Swartbooispruit.				
Contamination/Pollution of groundwater from leaks/spillages of either hydrocarbons, waste or wastewater	Remedy through rehabilitation, proper removal and disposal if soils have become contaminated	• The approved Integrated Water and Waste Management Plan to be implemented (when the WUL has been authorised).	Prevention of soil and water pollution.	Implement IWWMP Monitoring prescribed	As needed	ECO, Site Manager
Contamination/Pollution of surface water from leaks/spillages of either hydrocarbons, waste or wastewater	Visual inspection/confirmation that no additional surface impacts are occurring. Management and Rehabilitation (If required)	• The approved Integrated Water and Waste Management Plan to be implemented (when the WUL has been authorised).	Prevention of soil and water pollution.	• During the operational phase of the development water quality monitoring will be required quarterly and biomonitoring annually. • Monitoring Points: 1.Kilo Sand US 25°53'55.13"S, 28° 2'21.84"E Swartbooispruit upstream point, south of the project area 2.Kilo Sand DS 25°53'21.06"S, 28° 2'0.05"E Swartbooispruit downstream point, north of the project area. The monthly surface water monitoring samples should be analysed for the following parameters: • pH • Electrical Conductivity	As per WUL to be applied for	ECO, Site Manager

Potential Impact	Monitoring Compliance & Reporting / Mitigation Type	Management And Mitigation Measures	Management Outcome / Objectives	Functional Requirements for Monitoring	Monitoring And Reporting Frequency	Responsibility
				• Turbidity • Sulphate • Nitrate • Nitrite • Dissolved Oxygen • E. coli • Free and Saline Ammonia		
Increased flooding and runoff due to soil compaction and impacts on surface water or riparian areas	Storm water Management, Monitoring, Infrastructure Design	• Ensure the effective operation of the storm water management system through continuous maintenance. • Implement erosion prevention measures and structures. The soil around the storm water outlets should be vegetated with grass to reduce erosion. • Ensure proper disposal of domestic waste and continuous clearing of litter across the development area. • Ensure sanitation infrastructure is properly maintained and malfunctions are promptly identified and remediated. • Removal of alien and invasive species must continue for a two-year maintenance period after development, on a biannual basis. • Ongoing implementation of the recommended monitoring plan to ensure that impacts to the surface water environment are detected timeously. • Corridor movement associated with water resources should not be hampered by the development. No sections of the river should be cordoned off. Loss of stream continuity should be prevented through ensuring that no obstructions of natural stream flow patterns occur. • Concurrent rehabilitation to be implemented, specifically revegetation of areas disturbed. All bare and exposed soils noted during a two-year	Prevention water pollution and impacts on the natural environment and surrounding water users.	Refer above unless stated otherwise in approved IWWMP	As per WUL to be applied for	ECO, Site Manager

Potential Impact	Monitoring Compliance & Reporting / Mitigation Type	Management And Mitigation Measures	Management Outcome / Objectives	Functional Requirements for Monitoring	Monitoring And Reporting Frequency	Responsibility
		maintenance period, including areas where alien vegetation is periodically removed, must be reseeded using the specified indigenous species recommended. • Bridges and culverts should be regularly inspected to ensure that no blockages occur.				
Impacts to wetlands - Channelled Valley Bottom associated with Swartbooispruit	Visual inspection/confirmation that no additional surface impacts are occurring. Management and Rehabilitation (If required)	• Any activities that take place within 500 meters of a wetland will require a Water Use Licence in terms of the National Water Act (Act 36 of 1998), however as far as possible, site clearance should take place outside of the exclusion buffer zone. Public open space and Low impact activities, including birding and hiking, can be allowed within the buffer. • Demarcate the wetland areas and buffer zones to limit disturbance, clearly mark these areas as no-go areas. • Monitor the occurrence of erosion during the rainy season and take immediate corrective action where needed. • Operational phase activities should not take place within wetlands or buffer zones. • Alien and invasive vegetation control should take place throughout all phases to prevent loss of floral habitat. • The duration of impacts on the wetland systems should be minimised as far as possible by ensuring that the duration of time in which flow alteration and sedimentation will take place is minimised. • Buffer zones should be maintained, in order to minimise sedimentation of the downstream areas. • Littering must be prevented by effective site management and the provision of bins. • Effective stormwater management should be implemented to avoid runoff to the wetland.	Prevention of soil and water pollution.	Monitoring of the condition of other portions in the MR (which should not suffer any surface impacts)	As per WUL to be applied for	ECO, Site Manager

Potential Impact	Monitoring Compliance & Reporting / Mitigation Type	Management And Mitigation Measures	Management Outcome / Objectives	Functional Requirements for Monitoring	Monitoring And Reporting Frequency	Responsibility
		• Waste management must be a priority and all waste must be collected and stored adequately. It is recommended that all waste be removed from site on a weekly basis to prevent rodents and pests entering the site. • No hunting, trapping or killing of fauna are allowed.				
Soil Erosion and sedimentation of water resources as a result of construction activities	Storm water Management, Monitoring, Infrastructure Design	• Do not develop in the delineated floodline • Adhere to WUL issued and approved IWWMP In accordance with Government Notice 704 (GN 704), the onsite management should: • Keep clean and dirty water separated; • Contain any dirty water within a system; and • Prevent the contamination of clean water.	Prevention water pollution and impacts on the natural environment and surrounding water users.	Implement IWWMP Monitoring prescribed	As per WUL to be applied for	ECO, Site Manager
Increased noise generation from construction activities.	Control through management and communication	Ensure noise are kept at acceptable levels	Ensure noise are kept at acceptable levels	Ensure Noise do not reach unacceptable levels	As needed	ECO, Site Manager
Increased air emissions/dust from construction activities.	Control through management and prevention of dust	Ensure air quality levels and dust emissions are kept in acceptable levels	Ensure air quality levels and dust emissions are kept in acceptable levels	Ensure Dust/Air Quality impacts do not reach unacceptable levels	As needed	ECO, Site Manager
Loss of vegetation as a result of site clearance	Infrastructure designs; Management; Monitoring	No SCC or protected species were identified as occurring or likely to occur on the project footprint. However, should SCC or protected species be found to occur on the development footprint relevant authorisations must be obtained, in terms of NEMBA (ToPS List), the TNCO and the National Forests Act, 1998 (Act No. 84 of 1998).	Prevention water pollution and impacts on the natural environment and surrounding water users.	Ecological Monitoring and Compliance	The monitoring should include the following: • Removal of alien and invasive species must continue for a two-year maintenance period after development, on a biannual basis.	ECO, Site Manager
Impacts to Faunal species within and surrounding landscape	Storm water Management, Monitoring, Infrastructure Design	• Prohibit / control access to portions of the property that is to remain undeveloped; and ensure that animals are not impacted on (e.g., illegal hunting/harvesting) • Maintain any habitat corridors effectively. • No SCC or protected species were identified as occurring or likely to occur on the project footprint. However, should SCC or protected	Prevention water pollution and impacts on the natural environment and surrounding water users.	Ecological Monitoring and Compliance	• Implement an Observe and Report approach which will enable employees/residents to report any disturbance of fauna or degradation that they encounter during the operational phase.	ECO, Site Manager

Potential Impact	Monitoring Compliance & Reporting / Mitigation Type	Management And Mitigation Measures	Management Outcome / Objectives	Functional Requirements for Monitoring	Monitoring And Reporting Frequency	Responsibility
		species be found to occur on the development footprint relevant authorisations must be obtained, in terms of NEMBA (ToPS List), the TNCO and the National Forests Act, 1998 (Act No. 84 of 1998).				
Impacts on Heritage sites identified	Monitoring of water levels and possible impacts on the aquifer	• Site B07, a cemetery that is no longer in use: Maintain a fenced-off conservation buffer of 30 m, a plaque indicating the presence of the cemetery. Alternatively, the graves may be relocated by a professional graves relocation unit. • Should skeletal remains be exposed, all activities must be suspended, and the relevant heritage resources authority contacted (See National Heritage and Resources Act, 25 of 1999 section 36 (6)). Also, should culturally significant material be discovered during the course of the said development, all activities must be suspended pending further investigation by a qualified Archaeologist.	Prevention decreasing water availability and impacts on the natural environment and surrounding water users.	No impacts on Heritage Resources	Should culturally significant material be discovered during the course of the said development, all activities must be suspended pending further investigation by a qualified Archaeologist. Maintain the 30 m buffer surrounding the buffer of 30 m, a plaque indicating the presence of the cemetery, as well as monitoring by the appropriate appointed person.	ECO, Site Manager
Potential visual impact on the viewpoints	Monitoring and Rehabilitation if required	• Maintain planted indigenous trees • Maintain buildings and township structures, including gardens and open spaces by means of a landscape maintenance plan	Early detection and prevention of possible impacts.	Monitor general condition and implement good housekeeping	Monitor good housekeeping monthly, visual improvements and rehabilitation success possible quarterly.	ECO, Site Manager
Generation and disposal of general waste, litter and hazardous material during operational phase	Environmental Awareness, Monitor waste	• Ensure enough bins are permanently made available. • Restrict access to the riverine and wetland system to prevent waste being dumped into the surface water environment. • Waste should be collected and disposed of at a licensed waste facility. • Identify disposal sites for the various categories of waste likely to be generated on site.	Responsible waste management and prevention of pollution.	Monitor volumes of waste disposed/ generated and volumes removed by Contractors	Ensure timely service delivery – at least once a week for rubbish removal	ECO, Site Manager

Potential Impact	Monitoring Compliance & Reporting / Mitigation Type	Management And Mitigation Measures	Management Outcome / Objectives	Functional Requirements for Monitoring	Monitoring And Reporting Frequency	Responsibility
		• Make sure general cleanliness on site is maintained in accordance with landscape management plan. • Reduce, recycling and reuse of waste must occur whenever possible. • Recycling bins must be separate and clearly marked according to material. • Waste must be stored safely away from employees' and residents' exposure. • Construction debris is not to be buried on site. • No burning of waste to occur on site, unless to remove alien seeds from storage sites.				
Need for services e.g. water, electricity and sewerage systems, causing additional strain on natural resources and service infrastructure.	Infrastructure designs; Management; Monitoring	• Energy savings measures to be implemented, e.g.: No lights to be switched on unnecessarily. Only security lights to be switched on at night. • Energy saving bulbs to be installed; and • Sewerage system should be managed in accordance with WUL and services regularly by a suitably qualified Contractor. • Water saving taps could be installed in the houses and outside houses if possible by applicant (in gardens).	Minimise and manage service requirements	Energy and water saving initiatives	Continuous	ECO, Site Manager
The change in the traffic patterns as a result of increased traffic entering and exiting the specific area (Knopjeslaagte)	Infrastructure designs; Management; Monitoring	• Ensure speed limits are shown and implemented on the roads.	Traffic Control and prevention of impacts	N/A	N/A	ECO, Site Manager
Increased job opportunities	Appoint local service providers if any maintenance or upgrades are proposed	• Appoint local service providers if any maintenance or upgrades are proposed. • Meet the requirements of the government policies for procurement and employment, as are applicable to local government, to take care of and avoid potential conflict between people in the immediate surroundings seeking employment and those from elsewhere.	Prevent and/or remediate ecological impacts	N/A	N/A	ECO, Site Manager

7. STORMWATER MANAGEMENT PLAN

Table 7: Storm water Management Plan and Management of Activities in Close Proximity of the Swartbooispruit River

Impact	Mitigation / Management Objectives	Mitigation/Management Actions	Management Outcome/ Objectives	Functional Requirements for Monitoring	Monitoring Compliance & Reporting	Monitoring Frequency	Responsibility
Design and Planning Phase							
Impact of the project if a detailed storm water management plan is not correctly prepared.	To limit the effect of uncontrolled storm water runoff from developed areas onto natural areas.	• Establishment of stormwater management infrastructure as per approved layout. • Sewerage and stormwater management features could be municipal services for the specific project, but if not, the following aspects must all be adhered to: • Prepare a detailed stormwater management plan outlining appropriate treatment measures to address runoff from disturbed portions of the site, such that they do not: ○ Result in concentrated flows into natural watercourses i.e., provision should be made for temporary or permanent measures that allow for attenuation, control of velocities and capturing of sediment upstream of natural water courses. ○ Result in any necessity for concrete or other lining of natural water courses to protect them from concentrated flows of the development. ○ Divert flows out of their natural flow pathways, thus depriving downstream watercourses of water.	Implement IWWMP Monitoring prescribed	As per WUL to be applied for	• Apply for WUL as a WUL is triggered by the township development and bridges and culverts will also be implemented in proximity of the dams and river system (Swartbooispruit). • Management Plans and Rehabilitation plans will be therefore required for the implementation of the structures within sensitive zones and close proximity of the Swartbooispruit • Check compliance with specified conditions. • Ensure that this is taken into consideration during the planning and design phase by reviewing signed minutes of meetings or signed reports.	Once-off during design followed by regular control	Contractor ECO
Construction Phase							
Diversion and impedance surface water flows – changes to the hydrological	Prevent interference with natural runoff patterns, diverting flows	• The appointed Contractor should compile a Method Statement for Storm water Management during the construction phase. • Erosion and sedimentation into water bodies must be minimised through the effective stabilisation (gabions	Implement IWWMP Monitoring prescribed	As per WUL to be applied for	• Compile a Method Statement for Storm water Management during the construction phase. • Inspect and verify if a Method Statement for Storm water	Prior to the construction phase. Once-off prior to the	Contractor ECO

regime and increased potential for erosion. Diversion and increased velocity of surface water flows – reduction in permeable surfaces.	and increasing the velocity of surface water flows.	and Reno mattresses or similar) and the re-vegetation of any disturbed riverbanks. • Place energy dissipation structures in a manner that allows the management of flows prior to being discharged into the natural environment, thus not only preventing erosion, but supporting the maintenance of natural base flows within these systems i.e., hydrological regime (water quantity and quality) is maintained. • Reinforce soil slopes to minimise erosion during rehabilitation (as needed, and once construction in a specific area has ceased). • Perform periodic inspections and maintenance of soil erosion measures and stormwater control structures.			Management has been compiled by the Contractor via audits prior to the commencement of the construction phase. • Check compliance with specified conditions of the Stormwater Management Plan and Method Statement. • Check compliance with specified conditions of the Stormwater Management Plan and Method Statement. • Monitor activities and record and report noncompliance.	commencement of the construction phase. Weekly or Bi-weekly As needed during the construction phase	
Operational Phase							
Pollution of the surrounding environment as a result of the contamination of storm water. Contamination could result from the spillage of chemicals, oils, fuels, sewage, solid waste, litter etc.	To prevent contaminated storm water from entering into and adversely impacting on freshwater ecosystems and reducing the water quality. To reduce sedimentation of nearby water systems. To apply best practice principles in	• The appointed Contractor should compile a Method Statement for Storm water and implementation thereof. • Management during the construction phase. Provide secure storage for fuel, oil, chemicals, and other waste materials to prevent contamination of storm water runoff. Fuels and chemicals (i.e., any hazardous materials and dangerous goods) used during the construction phase must be stored safely on site and in bunded areas. Fuel and chemical storage containers must be inspected to ensure that any leaks are detected early. • All stockpiles must be protected from erosion and stored on flat areas where run-off will be minimised. Erosion and sedimentation into water bodies must be minimised through effective stabilisation. No stockpiling should take place within a watercourse. • Topsoil Stockpiles (to be used for rehabilitation of ditches or excavations) must be located away from river channels i.e., greater than 32 m.	Implement IWWMP Monitoring prescribed	As per WUL to be applied for	• Compile a Method Statement for Storm water Management during the construction phase. • Inspect and verify if a Method Statement for Storm water Management has been compiled by the Contractor via audits prior to the commencement of the construction phase. • Monitor the storage and handling of dangerous goods and hazardous materials on site via site audits and record noncompliance and incidents. Monitor if spillages have taken place and if they are removed correctly. • Monitor the excavations and stockpiling process throughout	Prior to the construction phase. Once-off prior to the commencement of the construction phase.	Contractor and ECO

	managing risks to storm water pollution.	• Littering and contamination of water resources during construction must be prevented by effective construction camp management. Emergency plans must be in place to deal with potential spillages (especially those leading to any watercourses). • Erosion and sedimentation into water bodies must be minimised through the effective stabilisation (gabions and Reno mattresses or similar) and the re-vegetation of any disturbed riverbanks. • Ensure that the temporary site camp and ablution facilities are established at least 32 m away from the banks of the major drainage lines. • Ensure that there is no ad-hoc crossing of channels by vehicles during the construction phase. Access routes across the site should be strictly demarcated and selected with a view to minimise impacts on drainage lines. • Ensure that no waste materials or sediments are left in the surrounding drainage lines (as a result of the construction). • Regular inspections of storm water infrastructure should be undertaken to ensure that it is kept clear of all debris and weeds.			the construction phase via visual site inspections. Record non-compliance and incidents. • Monitor via site audits and record non-compliance and incidents (i.e., by implementing walk through inspections). • Check compliance with specified conditions of the Stormwater Management Plan and Method Statement. • Check compliance with specified conditions of the Stormwater Management Plan and Method Statement. • Monitor the placement of the site camp via visual inspections, and record and report any non-compliance. • Check compliance with specified conditions of the Stormwater Management Plan and Method Statement. • Check compliance with specified conditions of the Stormwater Management Plan and Method Statement. • Monitor via site audits and record non-compliance and incidents (i.e. by implementing walk through inspections).		

8. WASTE MANAGEMENT PLAN

Table 8: Waste Management Plan

Impact	Mitigation / Management Objectives	Mitigation/Management Actions	Monitoring Compliance & Reporting	Monitoring Frequency	Responsibility
Design and Planning Phase					
Impact of the project if a detailed waste management plan is not correctly prepared.	To prevent environmental contamination through effective and thorough planning and design.	• Waste management must ensure that the construction and operation of the township will not impact on the wetland areas nor the Swartbooispruit River. • The wastewater, sewerage and storm water will likely be municipal service, or will be included in the WUL to ensure proper functioning and management. • Project engineers should compile a method statement, outlining the construction methodologies. Mitigation measures should be included in this method statement that must be approved by the ECO and be available on site.	• Inspect and verify implementation of the suggested measures in this EMPr. • Ensure that this is taken into consideration during the planning and design phase, and Management to ensure development occurs as per the approved design and layout plan.	Once-off during design followed by regular control	Management Contractor ECO
Construction Phase					
Pollution of the surrounding environment from the spillage of chemicals, oils, fuels, sewage, solid waste, litter etc.	To prevent groundwater contamination and/or water quality reduction as a result of contaminant seepage.	The waste and wastewater management system must be constructed in a manner that ensures that the waste is effectively removed from the houses.	• Management to ensure development layout and plan verifies the proposed mitigation measures of this EMPr. • Ensure construction plan verifies the proposed mitigation measures of this EMPr.	During the planning and construction of the facility structures.	Management and/or Design Engineer / Contractor
Operational Phase					
Soil, surface water and groundwater pollution from the ineffective containment of wastewater in the systems designed for it.	To manage wastewater and to prevent pollution of the environment.	• All waste produced to be disposed of in permitted designated waste disposal site. • Waste must be stored in designated areas for storage.	Management must verify implementation of the proposed mitigation measures of this EMPr.	Ongoing	Management ECO

		• Clearly demarcate appropriate storage for the different types of waste. • Ensure regular removal of waste on site to prevent attraction of pests and disposal of waste in a permitted disposal site.	• Monitor activities and record and report noncompliance.		

10. ENVIRONMENTAL AWARENESS AND TRAINING PLAN

The Applicant/Management has to appoint an independent Environmental Control Officer whose duty is to also implement an effective Environmental Awareness Plan (EAP) aimed to educate workers and contractors in terms of the biodiversity on site, environmental risks associated with the proposed development and land management of the site. Training and/or awareness should be raised and effectively communicated prior to the commencement of the construction phase. Training sessions should incorporate the management plans addressed in this EMPr as well as any new information and documentation provided by the ECO, as well as that of the Environmental Health & Safety Officer. The ECO would be the most suitable person to conduct these training sessions, identifying sensitive environments as well as all the risks and impacts, such as effluence, associated with the township development, and the methods in which to deal with the impacts in order to avoid environmental degradation.

The SM/ECO shall ensure that the construction team and all-contractor/s and employees (operational phase) are familiar with the EMPr requirements and have a basic level of environmental awareness training. The SM shall undertake basic environmental awareness induction training prior to the start of construction activities on site. Topics to be covered by the training should include inter alia:

- What is meant by “environment”?
- Why the environment needs to be protected and conserved.
- How construction and operational activities can impact on the environment.
- What measures can be taken to mitigate against these impacts.
- Prevention of pollution and litter control and the minimisation of disturbance to sensitive areas.
- The need for a “clean site” policy also needs to be conveyed to construction workers.
- Worker conduct on site which encompasses a general regard for the social and ecological well-being of the site and adjacent areas.

Training sessions can be monitored by providing an attendance register indicating the workers that received training as well as evidence of the training and/or awareness received. The material of information used to compile the EAP will be based on the approved NEMA EMPr, as well as other relevant specialist reports. The documents will be utilised to compile a database, which will contain all medium to high significant environmental aspects and issues. The environmental issues and aspects will be entered into the database with associated mitigation measures and responses, along with the specific legislation that governs such an impact or aspect (Refer to Table 9 below).

Table 9: Environmental Awareness and Training Example

Environmental Impact	Legislative Requirements	Background / Site Context	Objectives	Performance Indicators	Procedures / Mitigation and Management Measures	Monitoring and Reporting	Responsibilities
EXAMPLE Excessive dust generation which impacts air quality and health and safety of the workers and adjacent community.	NEM: AQA (No. 39 of 2004) Dust Control Regulations (GN 872 November 2013)	Dust generation as a result of site establishment and bulk earthworks (construction phase) and haulage, blasting and mineral processing and storage (operational phase)	Minimize dust generation and associated nuisance during construction and operational phases.	Gravimetric Dust Fallout must fall below the stipulated limit of 1200 mg/m²/day; No evidence or reports of significant dust issues.	Operator vehicles to keep to a 20km/hr speed limit on gravel access roads on site to minimise dust generation. Use water for damping down dust on roads wherever possible. Ensure establishment of vegetation in previously disturbed areas. Dust suppression on stockpile areas on windy periods.	Site Manager	Site Manager and Applicant

UNDERTAKING

Confirm that the undertaking required to meet the requirements of this section is provided at the end of the EMP and is applicable to both the Basic assessment report and the Environmental Management Programme report.

The EAP, Elemental Sustainability (Pty) Ltd, herewith confirms

a) The correctness of the information provided in the reports;

b) The inclusion of comments and inputs from stakeholders and I&AP's;

c) The inclusion of inputs and recommendations from the specialist reports where relevant; and

d) The acceptability of the project in relation to the finding of the assessment and level of mitigation proposed;

Signed at.....on this.....day .....

Signature of applicant .....

Designation.....

COMMITMENT/UNDERTAKING BY THE APPLICANT

I, ……, the undersigned and duly authorised thereto by……..

undertake to adhere to the requirements and to the conditions as set out in the EMPR submitted to GDARD and approved on .....

.....

Signed at.....on this..... day .....

Signature of applicant .....

Designation.....

END

REFERENCES

- Refer to Draft Basic Assessment Report