

REC ESTABLISHERS (PTY) LTD

**BASIC ASSESSMENT REPORT IN TERMS OF NEMA
PROPOSED DEVELOPMENT OF A SCHOOL ON PORTION 62
OF THE FARM COMMISSIESDRIFT 327JQ, OLIFANTSNEK,
RUSTENBURG LOCAL MUNICIPALITY, NORTH WEST
PROVINCE**

NWP/EIA/26/2019

**NOVEMBER 2019
(FINAL)**



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Appendix A: EAP

- Company profile: HydroScience
- Curriculum vitae: Ms Paulette Jacobs
- Qualification & Professional affiliations (SACNASP, WISA, IAIAAsa)
- Project list: NEMA applications only

Appendix B: Applicant & property information

- Applicant information
 - Company: REC Establishers (Pty) Ltd
 - Registration number: 2018/074281/07
 - Director: Paul Peens (I.D. 790904 5104 08 5)
- Property information
 - Property owner: REC Establishers (Pty) Ltd (2018/074281/07)
 - Portion 62 of the farm Commissiedrift 327JQ: Title deed: T37204/2018; Size: 28.9193ha

Appendix C: Photographs

- Surrounding land uses
- Existing structures / features on site
- Views in eight (8) major wind directions

Appendix D: Site Development Plan (SDP)

Appendix E: Specialist (studies and declarations)

- Palaeontology: Dr F.J. Durand (July 2019)
- Archaeology and Cultural Heritage: Prof A.C. van Vollenhoven from Archaetnos Culture and Cultural Resource Consultants (July 2019)
- Biodiversity: The Biodiversity Company (July 2019)
- Geotechnical Engineering: Rocksoil (July 2019)
- Geohydrological: Geo-logic (July 2019)
- Traffic: EPS Consulting Engineers (October 2019)
- Civil Services: EPS Consulting Engineers (October 2019)

Appendix F: Public participation

- Newspaper notice
- Hand delivery of notices
- Registered mail
- Email communication
- Comments & responses
- Contact details of Interested and Affected Parties (confidential)

Appendix G: Other

- Motivation letter (need & desirability of school)
- Solid waste removal letter and card
- Sewage management
 - Package Sewage Treatment Plant – letter & design
 - Sewage sludge removal – WSSA & contractor letter
- Initiation of WULA process on eWULAas
- DWS pre-application meeting attendance register

LIST OF ACRONYMS AND ABBREVIATIONS AND DEFINITIONS

AIS	Alien and Invasive Species Regulations (2014)
Biodiversity	Diversity of genes, species and ecosystem on earth, and the ecological and evolutionary processes that maintain this diversity.
Biosphere Reserve	An ecosystem with plants and animals of unusual scientific and natural interest. It is a title given by UNESCO to help protect these ecosystems and associated species etc.
BPDM	Bojanala Platinum District Municipality (district municipality in which Rustenburg is located)
BPG	Best Practice Guidelines
BSP	Biodiversity Sector Plan (North West, 2015)
CARA	Conservation of Agriculture Resources Act, 1983 (Act 43 of 1983)
CBA	Critical Biodiversity Area (terrestrial and aquatic areas required to meet biodiversity targets for ecosystems, species or ecological processes, as identified in a systematic biodiversity plan)
CBD	Central Business District (centre of a town/city)
CFC	Chloro-Fluoro Carbons
CRSA	Constitution of the Republic of South Africa, 1996 (Act 108 of 1996) – Section 24 relates to environment
CSIR	Council for Scientific and Industrial Research
DEA	Department of Environmental Affairs (national authority responsible for environmental protection and implementation of NEMA)
DOL	Department of Labour
DTI	Department of Trade and Industry
DWS	Department of Water and Sanitation (national authority responsible for water protection and implementation of NWA, custodian of South Africa's water resources)
EAP	Environmental Assessment Practitioner (independent consultant administering NEMA processes on behalf of applicant)
EAPASA	Environmental Assessment Practitioner Association of South Africa
ECA	Environment Conservation Act, 1989 (Act 73 of 1989) – preceded NEMA
ECO	Environmental Control Officer

EIA	Environmental Impact Assessment (process required in terms of NEMA to obtain authorisation for listed activities)
EMF	Environmental Management Framework (Magaliesberg Protected Environment)
EMP	Environmental Management Programme/Plan
EO	Environmental Officer
ESA	Ecological Support Area (terrestrial and aquatic areas that are not essential for meeting biodiversity targets but play an important role in supporting the ecological functioning of one or more Critical Biodiversity Areas; or in delivering ecosystem services.
GIS	Geographic Information System
GNR	Government Notice Regulation (notices published in Government Gazette in terms of already promulgated laws, legislated by government)
GNR 324	Amendment of GNR 985 - Listing 3 deals with activities requiring environmental authorisation due to sensitive locations
GNR 325	Amendment of GNR 984 - Listing 2 deals with activities requiring environmental authorisation due to expected higher environmental impact – requires full EIA (scoping and EIA)
GNR 326	Amendment of GNR 982 - EIA regulations – procedures / requirements
GNR 327	Amendment of GNR 983 - Listing 1 deals with activities requiring environmental authorisation due to expected lower environmental impact – requires Basic Assessment only
GPS	Global Positioning System
HIA	Heritage Impact Assessment
IAIA	International Association of Impact Assessment
IBA	Important Bird (and Biodiversity) Area – of international significance for conservation of birds as identified by BirdLife International.
I&APs	Interested and Affected Parties (as identified during the Public Participation Process)
IDP	Integrated Development Plan
IRP	Integrated Resource Plan
mamsl	Metres Above Mean Sea Level
Listed Activities	Activities identified in terms of NEMA Sections 24 and 24D, which require environmental authorisation prior to commencement due to their potential environmental impacts. See GNR 324, 325, 326, 327
LUMS	Land Use Management Scheme

MAE	Mean Annual Evaporation
MAP	Mean Annual Precipitation
MBR	Magaliesberg Biosphere Reserve
MPE	Magaliesberg Protected Environment
NEMA	National Environmental Management Act, 1998 (Act 107 of 1998) – overarching environmental legislation in South Africa
NEM:AQA	National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004)
NEM:BA	National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004)
NEM:PAA	National Environmental Management: Protected Areas Act, 2003 (Act 57 of 2003)
NEM:WA	National Environmental Management: Waste Act, 2008 (Act 59 of 2008)
NFEPA	National Freshwater Ecosystems Priority Area
NHRA	National Heritage Resources Act, 1999 (Act 25 of 1999)
NWA	National Water Act, 1998 (Act 36 of 1998)
NW	North West (one of nine provinces in South Africa)
NW READ	North West Provincial Government: Department of Rural, Environment and Agricultural Development (Provincial authority responsible for environmental protection and implementation of NEMA)
OHSA	Occupational Health and Safety Act, 1993 (Act 85 of 1993)
OCHOA	Olifantsnek Concerned Home Owners Association
PRECIS	National Herbarium Pretoria (PRE) Computerised Information System
PPP	Public Participation Process
QDGC	Quarter Degree Grid Cell
RLM	Rustenburg Local Municipality (local authority in whose jurisdiction the project is located)
ROCLA	Rustenburg-Olifantsnek Corridor Landowners Association
SACNASP	South African Council for Natural Scientific Professions (body for the registration of professional natural scientists)
SAHRA	South African Heritage Resources Agency (authority responsible for implementation of NHRA)
SAHRIS	South African Heritage Resources Information System (electronic system onto which reports are loaded for comments from SAHRA)
SANBI	South African National Biodiversity Institute

SABS	South African Bureau of Standards
SANS	South African National Standards
SCC	Species of Conservation Concern
SDF	Spatial Development Framework
SDP	Site Development Plan
SHEQ	Safety, Health, Environment & Quality
SoE	State of the Environment Report
SPLUMA	Spatial Planning and Land Use Management Act, 2013 (Act 16 of 2013)
SUDS	Sustainable Urban Drainage Systems
UNESCO	United Nations Educational, Scientific and Cultural Organisation
VOC	Volatile Organic Carbons
WISA	Water Institute of Southern Africa
WULA	Water Use License Application

1 ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)

1.1 Details

Company:	HydroScience CC
Registration Number:	2008/056910/23 14 March 2008
Postal address:	P.O. Box 1322 Ruimsig 1732
Physical address:	C4 Cascades Office Park Corner of Wasbank and Weiling Streets Little Falls Johannesburg
Email address:	paulette@hydroscience.co.za
Telephone number:	+ 27 (0) 82 850 5482
Fax number:	+ 27 (0) 86 692 8820
Contact person:	Ms Paulette Jacobs I.D. 680526 0104 08 4
Professional registration:	South African Council for Natural Scientific Professions (SACNASP): 400005/07 Environmental Assessment Practitioner Association of South Africa (EAPASA): In progress
Membership:	Water Institute of Southern Africa (WISA): 24906 International Association of Impact Assessment (IAIAsa): 5266

1.2 Experience and expertise

HydroScience CC was established in 2008 after Ms Paulette Jacobs acted as an independent consultant (sole proprietor) since 2000. HydroScience is an environmental, water and waste management solutions provider. Refer to Appendix A for a company profile.

Ms Paulette Jacobs obtained her qualifications from the Rand Afrikaans University in Johannesburg in 1990 and has been in the water, waste and environmental field for the last 29 years, first in research for seven (7) years at the Council for Scientific and Industrial Research (CSIR) and since then in consulting (Pulles, Howard and De Lange Water Quality Management Consultants, SRK Consulting, sole proprietor, HydroScience). Refer to Appendix A for Curriculum Vitae of Ms Paulette Jacobs. Ms Paulette Jacobs assisted Department of Water Affairs and Forestry (now Department of Water and Sanitation, DWS)

to compile the Best Practice Guidelines for water resource protection in the mining industry and has successfully completed many Water Use Licence (WUL) Applications in terms of the National Water Act (NWA), 1998 (Act 36 of 1998) as well as Environmental Impact Assessments (EIA) in terms of the National Environmental Management Act, 1998 (Act 107 of 1998) as amended for the industrial, retail, commercial/business and residential sectors to obtain environmental authorisations, Atmospheric Emissions Licenses (AEL) and Waste Management Licenses (WML) over the last 19 years. Refer to Appendix A for a project list of applications for environmental authorisation in the North West Province.

1.3 Supporting information

Appendix A contains:

- Company profile: HydroScience
- Curriculum vitae: Ms Paulette Jacobs
- Professional affiliations: Ms Paulette Jacobs
- Project list: North West Province NEMA applications

1.4 Assumptions, limitations, disclaimer and copyright

The findings, results, observations, conclusions and recommendations given in this report are based on the author's best scientific and professional knowledge as well as available information at the time of compilation (July - August 2019). The report is based on review and assessment techniques which are limited by time and budgetary constraints relevant to the type and level of investigation undertaken (Basic Assessment process) and HydroScience and its staff reserve the right to modify aspects of the report if and when new information may become available from changes in legislation, on-going research or further work in this field, or pertaining to this investigation.

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REC Establishers (Pty) Ltd is responsible for the implementation of recommendations and HydroScience cannot and will not take responsibility for the actions or lack thereof.

1.5 Declaration of independence

I, **Paulette Jacobs**, declare that –

- I act as an independent environmental, water and waste consultant in this investigation;
- I have expertise in water, waste and environmental management, including knowledge of the relevant Acts, Regulations and any guidelines that have relevance to the investigation;
- I have performed the work relating to this investigation in an objective manner, even if this results in views and findings that are not favourable to any party involved;
- I have included the specialist studies provided to me in Appendices as well as summarised findings and recommendations in this report;
- I have recorded and included comments received from stakeholders and interested and affected parties in the report;
- I undertake to disclose all material information in my possession that reasonably has or may have the potential to influence this investigation, unless access to that information is protected by law, in which case it will be indicated that such information exists;
- I do not have any vested interest (either business, financial, personal or other) in the investigation other than fair remuneration for work performed; and
- I will provide the parties with access to all information at my disposal regarding the investigation, whether such information is favourable or not.

Signature: Paulette Jacobs

2 APPLICANT / PROPONENT

2.1 Details

Company:	REC Establishers (Pty) Ltd
Registration Number:	2018/074281/07 Registration date: 13 February 2018
Postal address:	P.O. Box 6669 Rustenburg 0300
Physical address:	184 Machol Street Olifantsnek Rustenburg 0299
Email address:	paul@rec.co.za
Fax number:	+ 27 (0) 86 590 6602
Contact person:	Paul Peens I.D. 790904 5104 08 5 Cellular number: 076 197 0002

2.2 Supporting information

Appendix B contains details on the applicant and property.

3 PROPERTY

3.1 Locality details

Province:	North West
District Municipality:	Bojanala Platinum District Municipality (BPDM) <u>Contact person:</u> Joshua Moss Cellular number: 083 861 3661 Email: joshuam@bojanala.gov.za
Local Municipality:	Rustenburg Local Municipality (RLM) P.O. Box 16 Rustenburg 0300 Tel: 014 590 3185 Fax: 014 590 3070 <u>Contact person:</u> Ms Kelebogile Mekgoe Cellular number: 072 585 9460 Email: kmekgoe@rustenburg.gov.za
Ward:	36 Ward councillor: Cllr P. Tsienyane Cellular number: 082 365 0633 Email: pogisotsienyane@gmail.com
Closest town:	Rustenburg is located ± 15 km north of the property
Topographical QDGS:	2527 CC
Property description:	Farm: Commissiesdrift 327JQ Portion: 62
Surveyor General Code:	T0JQ00000000032700062
Coordinates (WGS84):	25 ^o 47' 24.19" South 27 ^o 14' 23.09" East 25.789957 ^o South 27.238811 ^o East
Description:	The property is located both sides of the R24 but the project area is located east of the R24, ± 1 km west of the Olifantsnek Dam.

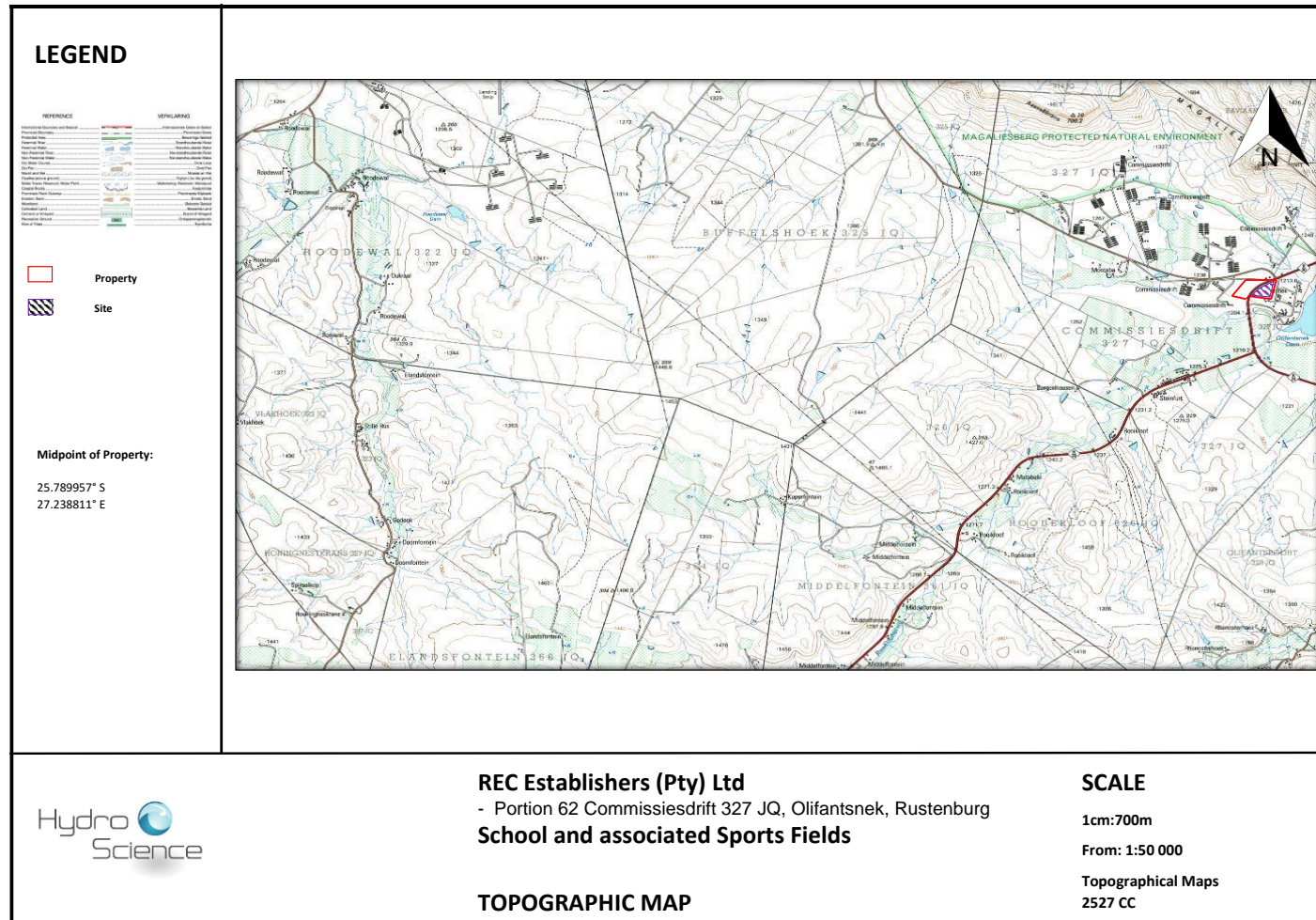
See Figures 3.1 and 3.2 below.

3.2 Property details

Property description:	Remainder of Portion 62 (a portion of portion 46) of the farm Commissiesdrift 327JQ
Property ownership:	REC Establishers (Pty) Ltd (2018/074281/07) Title deed: T37204/2018
Sizes:	Property: 28.9193 ha Project area: ± 15ha
Access:	Current and future: The property can be accessed via the R24 (western boundary of project area) directly from Third Avenue to the east of the property boundary, which also provides access to the Olifantsnek residential area.
Land use:	Zoning: Agriculture 1998 – 2016: Cattle farm 2016 – current: Equestrian
Existing structures:	There are currently houses on the property which serve as staff accommodation and will remain.
Surrounding land use / character:	North: Magaliesberg ± 2.5km Filling station (other side of the R24) East: Olifantsnek Dam ±1km Olifantsnek residential area South: Olifantsnek residential area West: R24 Agricultural (poultry north west)
Water environment:	Water Management Area (WMA): Limpopo Quaternary Catchment: A22G Ecological Support Area (ESA): Project area is within ESA 1 & 2. Closest water body: Olifantsnek Dam ±1km east
Sensitivity:	Magaliesberg Biosphere Reserve (MBR): Property and project area are located within the buffer zone. Critical Biodiversity Area (CBA): Project area is within CBA 2. ESA: Project area is within ESA 1.

3.3 Supporting information

Appendix C includes photographs.



SCALE
 1cm:700m
 From: 1:50 000
 Topographical Maps
 2527 CC

Figure 3-1: Regional locality map (Topographical map 2527CC)

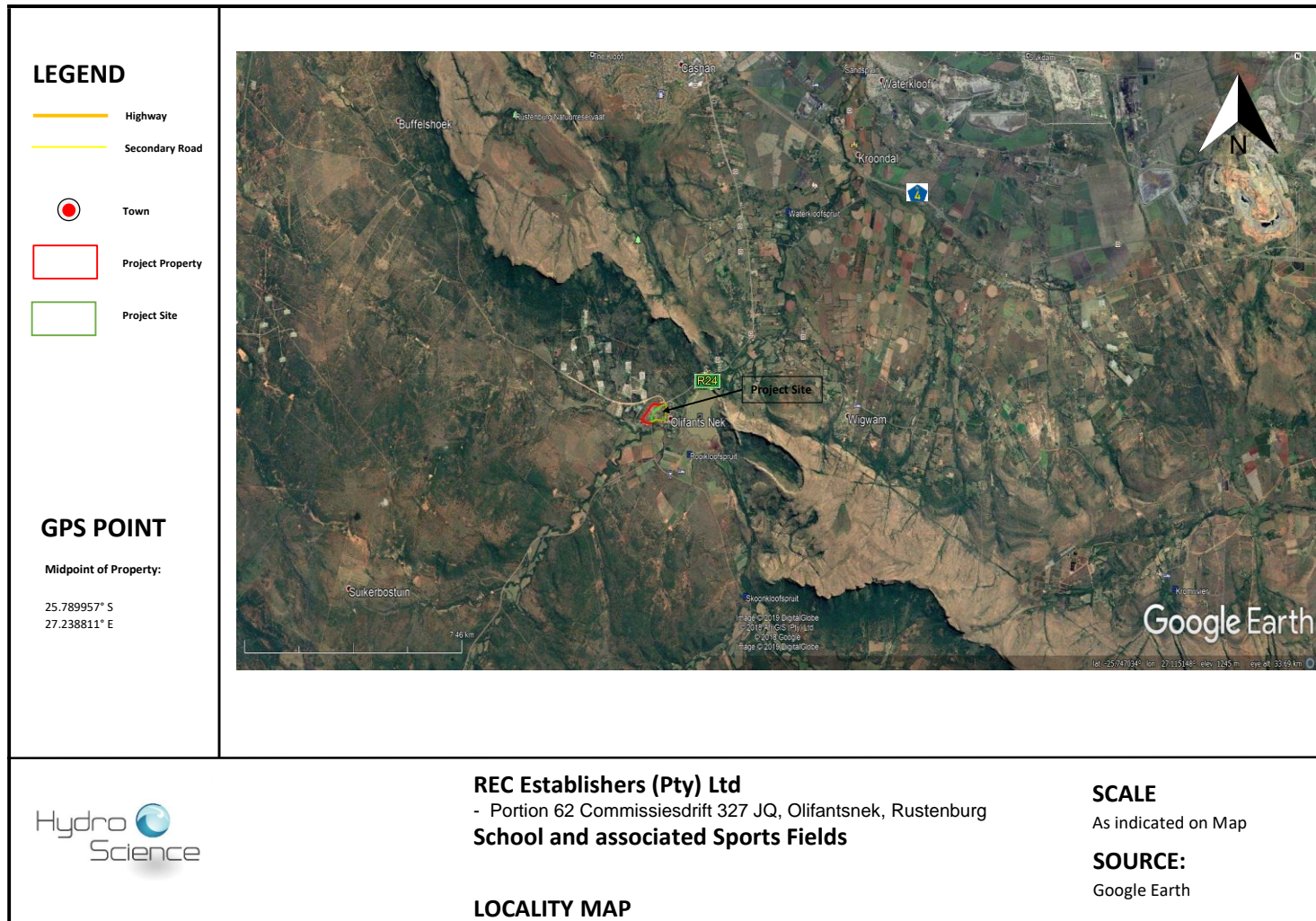


Figure 3-2: Regional locality map (Google earth™)

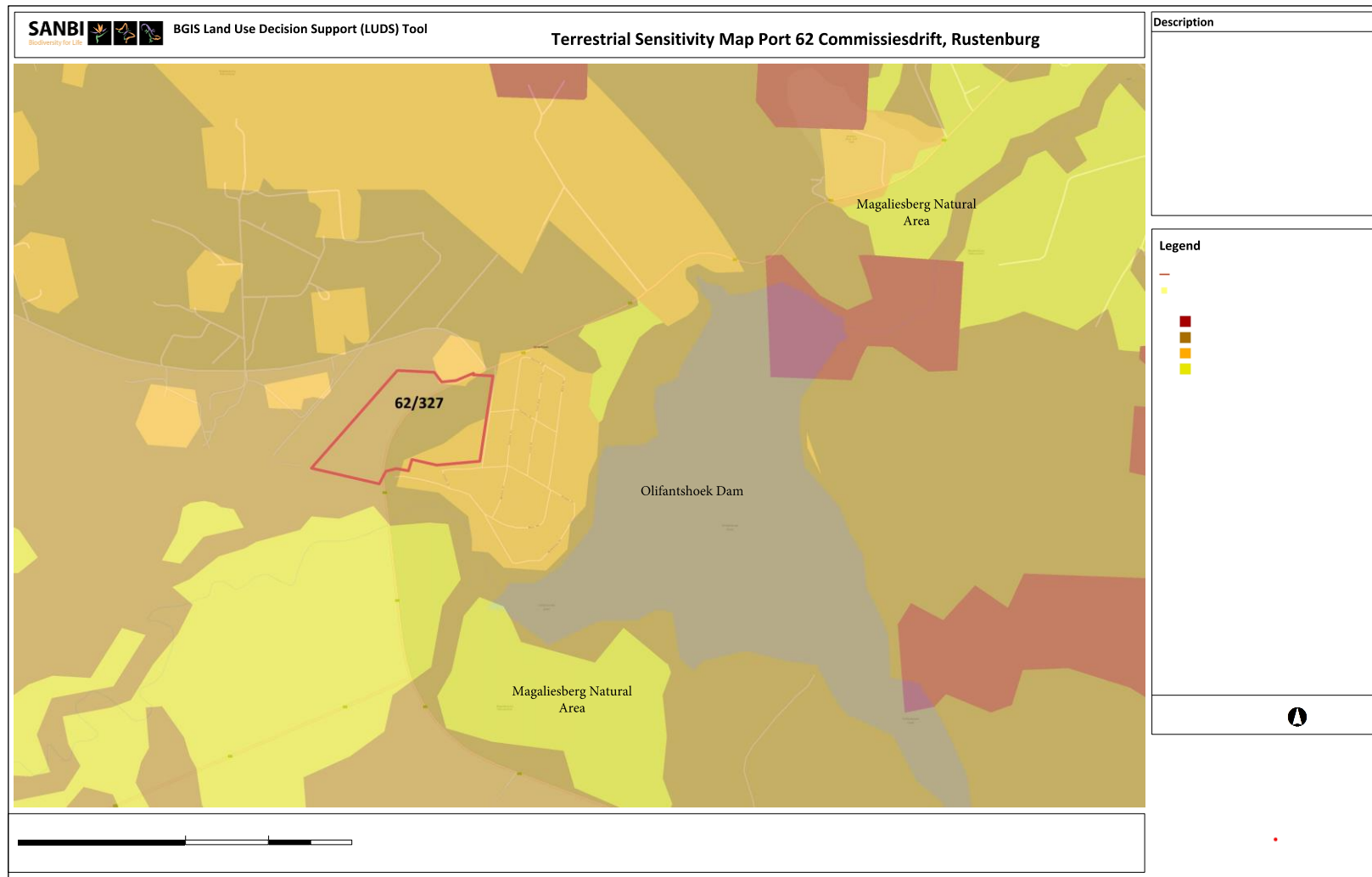


Figure 3-3: Terrestrial sensitivity (SANBI)

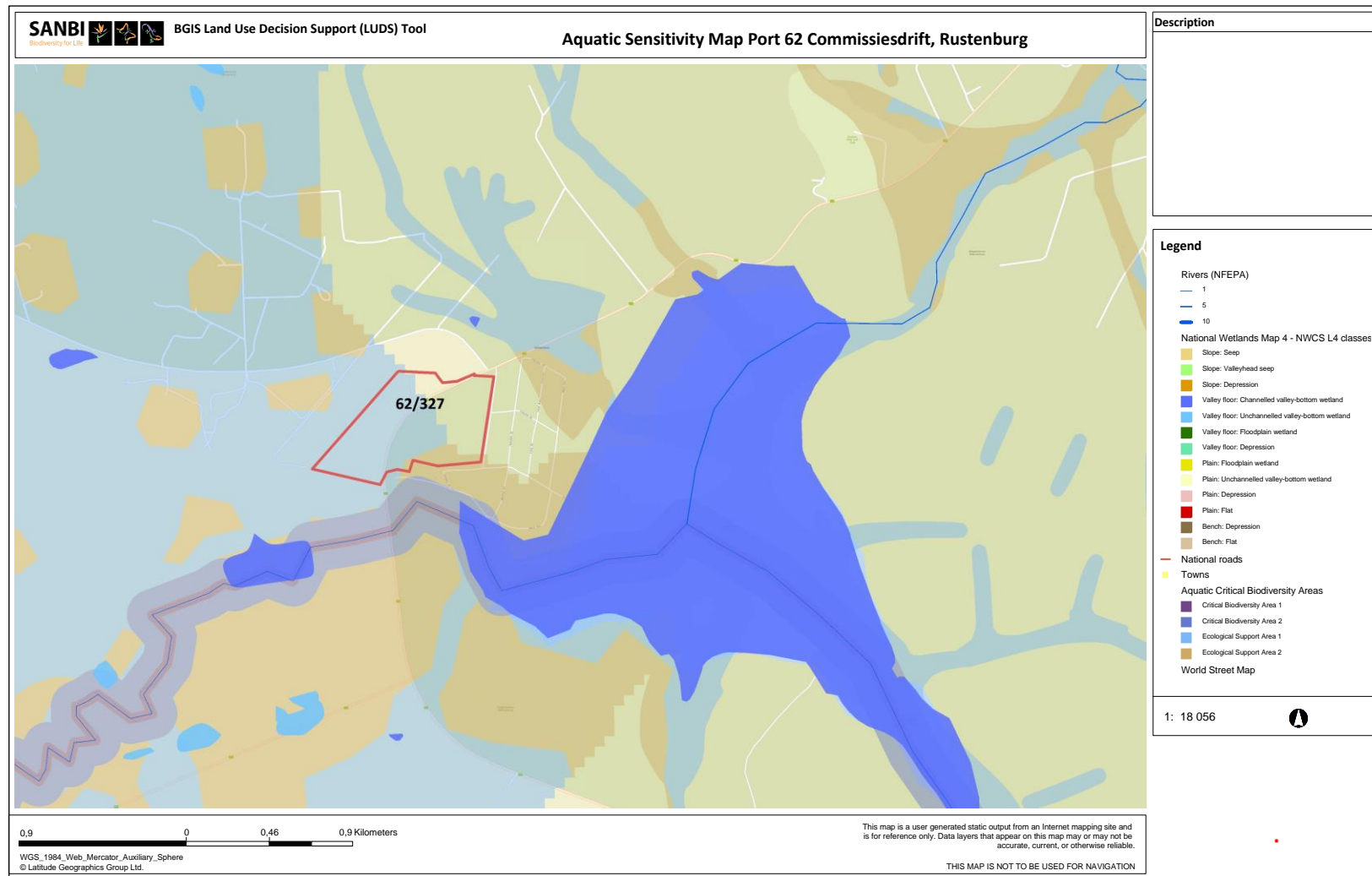


Figure 3-4: Aquatic sensitivity (SANBI)

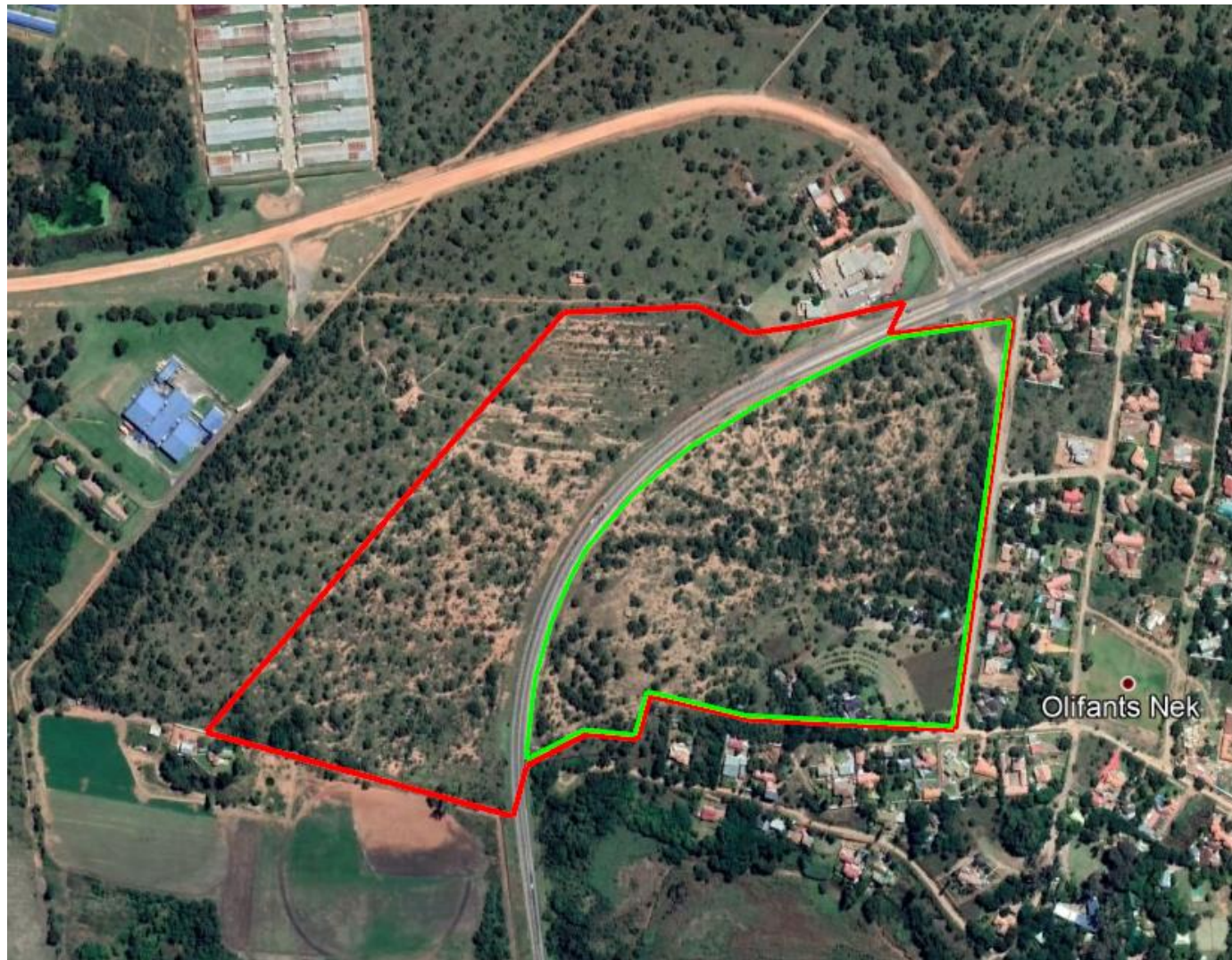


Figure 3-5: Project area on property (Google earth™)

4 PROJECT

4.1 Details

Project title:	Proposed development of a school on Portion 62 of the farm Commissiesdrift 327JQ, Olifantsnek, Rustenburg Local Municipality, North West Province.
Type of industry / sector:	Educational
Project description:	<p><i>GNR 327 of 7 April 2017, Activity 27: The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation.</i></p> <p>Portion 62 of the farm Commissiesdrift 327JQ is 28.9193ha in extent. An area of more than 1 hectares but less than 20 hectares will be cleared for the establishment of the school and associated sports fields. An estimated 15 ha area will be cleared.</p> <p><i>GNR 327 of 7 April 2017, 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 (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare.</i></p> <p>The school with associated sports fields, is an institutional development. The land was previously used for agricultural purposes (cattle farm from 1998 – 2016) and is currently used for equestrian purposes.</p> <p><i>GNR 324 of 7 April 2017, 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.</i></p> <p><i>h. North West</i></p> <p><i>iv. Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority.</i></p> <p>For the project, vegetation will be cleared to allow space for the establishment of structures and infrastructure. The property is located within a CBA 2 & ESA 1. The project footprint is ±15ha.</p> <p>Water supply will be from boreholes and a package sewage treatment plant will be established.</p>

	<p>The project includes the following according to the Site Development Plan (SDP):</p> <ul style="list-style-type: none"> • Access <ul style="list-style-type: none"> ○ Entrance for busses & delivery vehicles at circle on Third Avenue (70m from R24) ○ Entrance for administration and residential further along Third Avenue past Fouche Street intersection (existing) – 200m from R24 • Sports fields <ul style="list-style-type: none"> ○ Full size sports fields and Olympic size for athletics with pavilion and gymnasium (R24 and Third Avenue corner) ○ B sports field along R24 ○ Netball & Tennis courts (6) • Educational <ul style="list-style-type: none"> ○ Hall ○ Classrooms with toilets (9 on ground and 9 on first floor) ○ Study hall • Residential <ul style="list-style-type: none"> ○ Existing staff accommodation (4 houses) ○ Boarding for boys (along Stubb street) ○ Boarding for girls (along Stubb street) ○ Kitchen • Other <ul style="list-style-type: none"> ○ Parking ○ Administration and offices ○ Sewage Treatment Plan (STP) in south west corner
<p>Access:</p>	<p>Direct access from Third Avenue (Class 4b road) to the east of the property and project area as indicated above. The road is a paved road.</p>
<p>Project area:</p>	<p>Centre point: 25° 47' 24.19" South 27° 14' 23.09" East</p> <p>North eastern corner: 25° 47' 15.51" South 27° 14' 29.47" East</p> <p>South eastern corner: 25° 47' 30.03" South 27° 14' 29.29" East</p> <p>Western boundary along R24: 25° 47' 22.67" South 27° 14' 16.01" East</p>

<p>Emissions expected:</p>	<p>During the construction phase (short term), emissions may be expected from:</p> <ul style="list-style-type: none"> • Exhausts of construction vehicles travelling to, on and from the site as well as construction equipment / machinery exhausts. • Dust generation as a result of ground clearance (removal of vegetation), construction works (earth works) and associated vehicle movement. <p>During the operational phase, emissions released into the atmosphere would be minimal due to the nature of the activity (school) and a surfaced road being used for access. Busses will be used for transport and should be maintained in a good condition to prevent smoke and undue emissions.</p>
<p>Noise expected:</p>	<p>During the construction phase (short term), construction vehicles, machinery and equipment will definitely disturb the ambient environment.</p> <p>During the operational phase, school children and events / activities such as sports will increase the noise levels in the area.</p>
<p>Groundwater impacts:</p>	<p>Since the site does not have municipal services, groundwater will have to be used as water supply source and sewage generated will have to be managed on-site (sewage package treatment plant). The treated sewage will be used on site for irrigation.</p>

4.2 Screening and specialist input

The Department of Environmental Affairs (DEA) screening tool was used and a screening report generated. The following came from the report:

Aspect:	Sensitivity:	Requirement:
Landscape visual /	High	Visual Impact Assessment. No visual impact included. The highest buildings will be the classrooms which will have a ground and first floor.
Agricultural	High	No requirement based on DEA screening tool.
Archaeological and Cultural Heritage	High	Archaeological and Cultural Heritage Impact Assessment. Included in Appendix E (Archaetnos Culture and Cultural Resources Consultants, July 2019). No sites of heritage significance were found. Sites 1 (iron age / historical stone packed circle) & 3 (iron age / historical stone walling) have low cultural significance, description in specialist report is seen as sufficient. Site 2 (stone monolith) is of medium cultural significance and should therefore be included in the heritage register. A permit application is required to remove the stone.
Palaeontology		Palaeontological Impact Assessment. A desktop study is included in Appendix E (Dr J.F Durand, 9 June 2019). Due to contact thermal metamorphosis caused by the intrusion of Diabase and Bushveld Igneous Complex rocks into the Transvaal Supergroup, the chances of finding intact fossils of bacteria and microbial mats in these sedimentary rocks are very small.
Terrestrial biodiversity	Very high	Biodiversity Impact Assessment Included in Appendix E (The Biodiversity Company, July 2019). Flora: Site is situated in the Savanna biome, Moot Plains Bushveld vegetation type which is classified as Vulnerable (Mucina & Rutherford, 2006). No Species of Conservation Concern (SCC) of the expected 293 plant species. Avi-fauna: 19 of the 366 expected bird species are listed as SCC. The project area falls within the Magaliesberg Important Bird Area (IBA). Of specific international importance is the Cape Vulture and Secretarybird. However, due to the size of the IBA and the project area habitat, none of the species have a high likelihood to occur.
Avian biodiversity		
Aquatic biodiversity	Very high	

Aspect:	Sensitivity:	Requirement:
Geotechnical		Geotechnical assessment Included in Appendix E (Rocksoil, July 2019).
Socio-economic		Socio-economic assessment Refer to section (Section 8) on public participation which highlights public perception, expectation etc.
Civil aviation	High	No requirement – no impact on civil aviation.
Defence	Low	No requirement.

4.3 Need and desirability

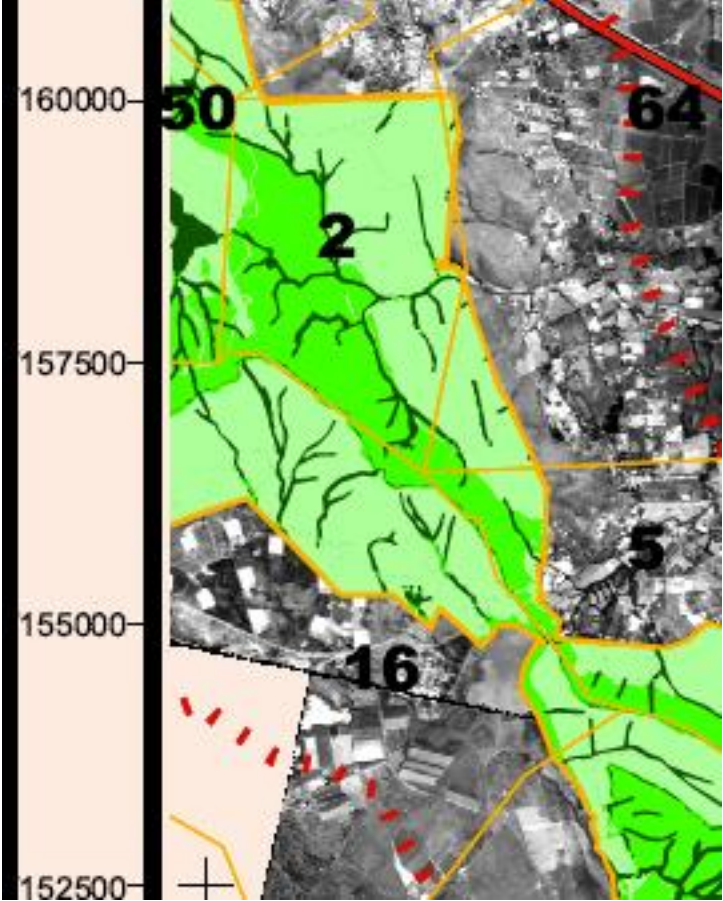
Addressing need and desirability is a way of ensuring sustainable development. Therefore the project must be ecologically sustainable and socially and economically justifiable.

Economic investment by applicant:	R50 million R1 million on road upgrades / improvements
Job creation:	Construction phase: 60 people Permanent during operational phase: 40 - 60 people Scholars: 600 with 300 in boarding.
Social need:	There is an existing school in Olifantsnek since 2005 but it has inadequate capacity to meet the need. 2017: A primary school was introduced on the same premises with 46 scholars. 2018: 107 scholars (more than 100% increase). 2019: 154 scholars 2020: already full The new school will be able to enroll 600 scholars and include a boarding facility to accommodate 300 of these scholars. 350 high school scholars can be moved to the new premises of which 130 will be accommodated in the boarding house as soon as the facilities are ready (current figures).
Department of Education requirements:	The Department of Education requires an area of 4ha per school. The current site is only 4.3ha and therefore additional surface area (property) is required to accommodate both a primary and high school. The new premises will be used as the high school premises and current premises will then serve only the primary school.

<p>Location:</p>	<p><u>Sensitivity:</u> CBA 2 - terrestrial area required to meet biodiversity targets for ecosystems, species or ecological processes, as identified in a systematic biodiversity plan. Refer to NW Biodiversity Sector Plan.</p>
<p>Rustenburg Spatial Development Framework (SDF), North West, 2010:</p>	<p><u>Purpose:</u> To guide the form and location of future physical development within a municipal area. <u>Review:</u> RLM is planning to review the SDF since it should be able to change to reflect changing priorities. <u>Development:</u> Largest settlements that contain the majority of the urban population (70%), have developed within 20 km from Rustenburg. The Olifantsnek area is within 15km of Rustenburg. <u>Plan:</u> Planned for single residential units (see map below - yellow).</p> <div data-bbox="624 779 1289 1733" data-label="Figure"> </div>
<p>RLM Environmental Management Framework (EMF)</p>	<p>Outside the urban edge with no municipal services. Nature of development (school) will not lead to urban sprawl. The area is marked as conservation in the EMF.</p>

<p>Magaliesberg Protected Environment (MPE) Environmental Management Framework (EMF) and Plan:</p>	<p>Site is not located within MPE.</p>
<p>North West Biodiversity Sector Plan, 2015:</p>	<p>Terrestrial: CBA 2 and ESA 1.</p> <p>The objective for CBA 2 is to maintain in a natural or near-natural state that maximises the retention of biodiversity pattern and ecological process. There are areas with intermediate irreplaceability or some flexibility in terms of meeting biodiversity targets. Therefore, there are options for loss of some components of biodiversity in these landscapes without compromising the ability to achieve biodiversity targets, although loss of these sites would require alternative sites to be added to the portfolio of CBAs. An invasive alien species eradication programme should be implemented. If threatened species are identified as being present, rehabilitation programs should explicitly consider these species in the development of restoration programs.</p> <p>Remaining patches larger than 5 ha of provincially Endangered and Vulnerable ecosystems (vegetation types), i.e. the amount of vegetation remaining intact (of these ecosystems) is less than 60%. Any further modification of these vegetation types should be limited to existing irreversibly modified or heavily degraded areas.</p> <p>Aquatic: ESA 1 & 2.</p>

<p>Magaliesberg Reserve Magaliesberg Zones, :</p>	<p>Biosphere (Introducing Biosphere</p>	<p>The property is located within the buffer zone of the Magaliesberg Biosphere Reserve (MBR).</p> <p>Buffer zones are predominantly natural or near natural areas and ecologically sensitive areas with clearly defined boundaries and formal administrative status.</p> <p><u>Buffer zones:</u> Areas, which usually surround or adjoin the core areas. Aimed at supporting the environmental integrity of the Core Area.</p> <p><u>Land uses and activities:</u> Conservation and maintenance of ecosystems, nature based recreation, eco-tourism, primary dwellings, new developments and small resorts coupled to conservation areas that are compliant with the EIA regulations. Only activities compatible with the conservation objectives of the MBR.</p> <p><u>Protection level:</u> No formal legal protection. Only should occur within the Buffer Zone. Greatest impact of a well-developed SDF with development guidelines.</p> <p><u>Evaluation criteria:</u></p> <ul style="list-style-type: none"> • Location is appropriate in terms of accessibility (existing roads, R24 and Third Avenue) and surrounding land use (Olifantsnek residential area, other school and sports fields) and therefore blends into the landscape. • Refer to EMPr for waste management and services as well as management and monitoring plan. • It will contribute to social improvement in local communities in terms of education. • Natural landscape and biodiversity are not conserved. • No cultural heritage resources to conserve. • Reuse of treated sewage for irrigation in terms of conservation of natural resources since groundwater will be abstracted as water supply source. <p>The MBR board evaluated the proposed project (see attached comments in Appendix F).</p>
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	 <p>Commissiesdrift (16) in MBR buffer (indicated by broken red lines)</p> <p>The buffer zone is for projects, which are socio-culturally and ecologically sustainable.</p>
<p>Fatal flaws:</p>	<p>No fatal flaws were identified.</p>

4.4 Service provision

Municipal services do not extend to the area. Groundwater will be abstracted from boreholes as water supply source and a package sewage treatment plant will be established.

5 LEGAL FRAMEWORK

5.1 Constitution of the Republic of South Africa (CRSA)

The Constitution of the Republic of South Africa (CRSA), 1996 (Act 108 of 1996) places a duty on the State to protect the environment. Section 24 states that:

“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
 - iii. secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.”

The right in the CRSA is given effect in several articles of national legislation including the National Environmental Management Act (NEMA), 1998 (Act 107 of 1998) as amended.

Section 29 of the constitution deals with education and states:

(1) Everyone has the right – (a) to a basic education

(3) Everyone has the right to establish and maintain, at their own expense, independent educational institutions that –

- (a) do not discriminate on the basis of race;
- (b) are registered with the state; and
- (c) maintain standards that are not inferior to standards at comparable public educational institutions.

This project is to address the need for basic education. This educational institution is registered with the state.

5.2 National Environmental Management Act (NEMA)

The National Environmental Management Act (NEMA), 1998 (Act 107 of 1998) as amended is the overarching environmental legislation in South Africa.

5.2.1 Sustainable development

The principle of Sustainable Development has been established in the CRSA and given effect by the NEMA. Section 1(29) of NEMA states that sustainable development means the integration of social, economic and environmental factors into the planning, implementation and decision-making process so as to ensure that development serves present and future generations. Thus, Sustainable Development requires that:

- The disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimised and remedied.
- That pollution and degradation of the environment are avoided, or, where they cannot be altogether avoided, are minimised and remedied.
- That the disturbance of landscapes and sites that constitute the nation’s cultural heritage is avoided, or where it cannot be altogether avoided, is minimised and remedied.
- That waste is avoided, or where it cannot be altogether avoided, minimised and re-used or recycled where possible and otherwise disposed of in a responsible manner.

- That a risk-averse and cautious approach is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions.
- Negative impacts on the environment, on people's environmental rights be anticipated; and, prevented, and where they cannot altogether be prevented, are minimised and remedied.

Duty of care is addressed in Section 28 of the NEMA.

In terms of sustainable development:

- ***An ecologist evaluated ecosystems and potential loss of biodiversity on the project footprint area. The ecosystem is Least Threatened. Though the North West Biodiversity Sector Plan classifies the area as CBA and ESA, the project area has been altered and degraded (due to current and historical impacts such as secondary roads, dumping of rubble, housing, livestock, alien invasive plant species, power lines and telephone lines) to a state where it does not represent the definitions of these areas and therefore has a reduced sensitivity (TBC, 2019).***
- ***A geohydrologist evaluated the pollution potential from the sewage generated and not feeding into a municipal sewer system. The risk was rated as low with the proposed management (HK Geohydrological Services, 2019).***
- ***A cultural heritage specialist evaluated the landscape for sites that constitute the nation's cultural heritage. No sites of heritage significance requiring conservation were found (Archaeos, 2019).***
- ***Waste and wastewater cannot be avoided in a development of this nature and will therefore have to be managed according to the Environmental Management Programme (EMPr).***
- ***Other potential negative impacts identified will also be managed through the EMPr.***

5.2.2 NEMA regulations

Government Notice Regulation (GNR) 982, 983, 984 and 985 of 4 December 2014 contain the latest regulations pertaining to Environmental Impact Assessment (EIA) under sections 24(5), 24M and 44 of the NEMA. These were amended / updated on 7 April 2017 under GNR 324, 325, 326 & 327.

GNR 982 as amended / updated in GNR 326 stipulate requirements in terms of processes to be followed and information to be included in documentation.

GNR 984 as amended / updated in GNR 325 was considered and no applicable activities were identified.

All activities identified for this project, which require environmental authorisation, are contained in GNR 983 as amended / updated in GNR 327 as well as GNR 985 as amended / updated in GNR 324 due to its location.

5.2.3 Listed activities applicable

The following listed activities require environmental authorisation:

GNR & Date	Activity Number and Description	Project Description
GNR 983 as amended / updated in GNR 327 of 7 April 2017	Activity 27: The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation.	Portion 62 of the farm Commissiesdrift 327JQ is 28.9193ha in extent. An area of more than 1 hectares but less than 20 hectares will be cleared for the establishment of the school and associated sports fields. An estimated 15 ha area will be cleared.
	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 (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare.	The school with associated sports fields, is an institutional development. The land was previously used for agricultural purposes (cattle farm from 1998 – 2016) and is currently used for equestrian purposes.
GNR 985 as amended / updated in GNR 324	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. h. North West iv. Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority.	For the project, vegetation will be cleared to allow space for the establishment of structures and infrastructure. The property is located within a CBA 2 & ESA 1. The project footprint is ±15ha.

5.3 National Environmental Management: Biodiversity Act (NEMBA)

5.3.1 Commitment to biodiversity conservation

Although South Africa became a signatory to the Convention of Biological Diversity in 1998, the more recent enactment of national legislation has affirmed our country's commitment to biodiversity and conservation as required in the CRSA. The National Environmental Management: Biodiversity Act (NEMBA), 2004 (Act 10 of 2004) has been promulgated by the South African President and was published in the Government Gazette in June 2004 (Volume 467; No. 26426). One of the objectives of this Act is to provide for the management and conservation of South Africa's biodiversity within the framework of the NEMA and to ensure the sustainable use of indigenous biological resources.

The Act, in protecting biodiversity, deals with:

- the protection of threatened ecosystems and species;
- the control of alien invasive species;
- the control of genetically modified organisms; and
- regulates bioprospecting.

As with NEMA, NEMBA incorporates and gives effect to international agreements relating to biodiversity.

5.3.2 Protection of threatened ecosystems and species

Ecosystems that are Critically Endangered, Endangered or Vulnerable can be listed in terms of Section 52 of the Act as threatened ecosystems at both national and provincial level. For example, Critically Endangered ecosystems are defined in the Act as being 'ecosystems that have undergone severe degradation of ecological structure, function or composition as a result of human intervention and are subject to an extremely high risk of irreversible transformation'. Importantly, any land-use change application occurring within an ecosystem listed as Critically Endangered or Endangered will automatically require environmental authorisation.

The project area is located within a CBA 2 and ESA 1.

Threatened or Protected Species Regulations of 2013 (GNR388 of 2013): Part 2 of NEMBA provides for listing of species that are threatened or in need of protection to ensure their survival in the wild, while regulating the activities, including trade, which may involve such listed threatened or protected species and activities which may have a potential impact on their long-term survival. In February 2007, the Minister of Environmental Affairs and Tourism published a list of Critically Rare, Endangered, Vulnerable and Protected Species, according to Section 56(1) of the Act, which was updated again in 2013.

No protected species were found on the project area. No Species of Conservation Concern (SCC) of the expected 293 plant species were found. The Giant Bullfrog and South African Hedgehog can occur on site but was not spotted. Nineteen (19) of the 366 expected bird species in the project area are listed as SCC.

5.3.3 Control of alien invasive species

The list of alien and invasive species are intended to provide a legal framework to manage and control alien species that are considered invasive and that have the potential to threaten biodiversity, water resources and agricultural potential. NEMBA has identified all species that should be considered as alien or invasive species, as well as the restricted activities relating to each species. It is now required by law (from 1 October 2014), for landowners to investigate the type and extent of alien invasive species growing on their property and to implement an effective control and eradication management plan.

Alien and invasive species were found on the property. Refer to Alien and Invasive Species Regulations, 2014 (GNR598). An alien eradication programme will be established to control alien and invader vegetation found on the property (refer to EMPr). Six (6) Category 1b invasive plant species were recorded namely Argemone ochroleuca, Cereus jamacaru, Datura ferox, Eucalyptus camaldulensis, Melia azedarach and Opuntia ficus-indica.

5.4 National Environmental Management: Protected Areas Act (NEMPAA)

The National Environmental Management: Protected Areas Act (NEM:PAA), 2003 (Act 57 of 2003) provides protection for ecologically viable areas representative of South Africa's biodiversity. The Magaliesberg Mountain Range, is a protected area in terms of the NEM:PAA.

The Environmental Management Framework (EMF) and Plan for the Magaliesberg Protected Environment (MPE) is aimed at addressing the requirements of an EMF as contemplated in the 2014 EIA Regulations, as well as the basic components of a Management Plan for a protected area as described in Section 41 of the NEM:PAA.

The Management Plan component is specifically applicable to the MPE, whereas the EMF considers the interaction of the MPE with its surrounding areas.

The project area is not located within the MPE (MPE is approximately 500m north).

5.5 National Environmental Management: Waste Act (NEMWA)

In terms of the National Environmental Management: Waste Act (NEMWA), 2008 (Act 59 of 2008), the following is relevant to this project:

- GNR 926 of 29 November 2013. National Norms and Standards for the Storage of Waste. ***The storage of waste material on the site has to comply with these Norms and Standards.***
- The RLM or a contractor will provide waste collection services to the area though it is outside the urban edge.

5.6 National Water Act (NWA)

5.6.1 Water uses

The National Water Act (NWA), 1998 (Act 36 of 1998) Section 21 defines water use as:

- (a) taking water from a water resource.
- (b) storing water.
- (c) impeding or diverting the flow of water in a watercourse.
- (d) engaging in a stream flow reduction activity contemplated in section 36.
- (e) engaging in a controlled activity identified as such in section 37(1) or declared under section 38(1).
- (f) discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit.
- (g) disposing of waste in a manner which may detrimentally impact on a water resource.
- (h) disposing in any manner of water which contains waste from, or which has been heated in, any industrial or power generation process.
- (i) altering the bed, banks, course or characteristics of a watercourse.
- (j) removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people.
- (k) using water for recreational purposes.

5.6.2 Legal requirements

The NWA states in Section 22 (1) that a person may only use water –

- (a) without a licence –
 - (i) if that water use is permissible under Schedule 1;
 - (ii) if that water use is permissible as a continuation of an existing lawful use; or
 - (iii) if that water use is permissible in terms of a general authorisation issued under section 39;
- (b) if the water use is authorised by a licence under this Act; or
- (c) if the responsible authority has dispensed with a licence requirement under subsection (3).

5.6.3 Applicability

The project area is not supplied with municipal services. A water use license application (WULA) will be lodged for:

- Section 21 (a) taking water from a water resource in terms of the abstraction of groundwater via boreholes as a water supply source for the project.
- Section 21 (e) engaging in a controlled activity identified as such in section 37(1) or declared under section 38(1) in terms of using treated sewage from the package sewage treatment plant for irrigation.
- Section 21 (g) disposing of waste in a manner, which may detrimentally impact on a water resource in terms of the package sewage treatment plant.

5.7 Conservation of Agricultural Resources Act (CARA)

Conservation of agricultural potential:

The aim of the Conservation of Agricultural Resources Act (CARA), 1983 (Act 43 of 1983) is to provide for control over the utilization of the natural agricultural resources of the Republic in order to promote the conservation of the soil, the water sources and the vegetation and the combating of weeds and invader plants; and for matters connected therewith.

To achieve this aim, the following objectives are included:

- To provide for the conservation of the natural agricultural resources of the Republic by the maintenance of the production potential of land;
- The combating and prevention of erosion and weakening or destruction of the water sources, and
- The protection of the vegetation and the combating of weeds and invader plants.

Though zoned as agricultural land the RLM SDF indicates it as residential.

Combating weeds and invader plants:

In 1984, regulations were passed in terms of the CARA, regulations declaring about 50 species “weeds” or “invader plants”. On 30 March 2001, the Minister of Agriculture promulgated an amendment to these regulations. This amendment then contained a more comprehensive list of species that are declared weeds and invader plants dividing them into three (3) categories. These categories are as follows:

- Category 1: Declared weeds that are prohibited on any land or water surface in South Africa. These species must be controlled, or eradicated where possible.
- Category 2: Declared invader species that are only allowed in demarcated areas under controlled conditions and prohibited within 30m of the 1:50 year flood line of any watercourse or wetland.
- Category 3: Declared invader species that may remain, but must be prevented from spreading. No further planting of these species is allowed.

In terms of the amendments to the regulations under the CARA, landowners are legally responsible for the control of alien species on their properties. An alien eradication programme will be established to control alien and invader vegetation as per the EMPr (refer to Section 5.3.3).

5.8 National Heritage Resources Act (NHRA)

5.8.1 Legislation

The National Heritage Resources Act (NHRA), 1999 (Act 25 of 1999) requires protection of the following cultural heritage resources:

- a. Archaeological artifacts, structures and sites older than 100 years;
- b. Ethnographic art objects (e.g. prehistoric rock art) and ethnography;
- c. Objects of decorative and visual arts;
- d. Military objects, structures and sites older than 75 years;
- e. Historical objects, structures and sites older than 60 years;
- f. Proclaimed heritage sites;
- g. Grave yards and graves older than 60 years;
- h. Meteorites and fossils; and
- i. Objects, structures and sites of scientific or technological value.

The national estate includes the following:

- a. Places, buildings, structures and equipment of cultural significance;
- b. Places to which oral traditions are attached or which are associated with living heritage;
- c. Historical settlements and townscapes;
- d. Landscapes and features of cultural significance;
- e. Geological sites of scientific or cultural importance;
- f. Archaeological and paleontological importance;
- g. Graves and burial grounds;
- h. Sites of significance relating to the history of slavery; and
- i. Movable objects (e.g. archaeological, paleontological, meteorites, geological specimens, military, ethnographic, books etc.).

5.8.2 Requirements

A Heritage Impact Assessment (HIA) is the process to be followed in order to determine whether any heritage resources are located within the area of concern (area to be developed) as well as the possible impact of the development thereon. An Archaeological Impact Assessment only looks at archaeological resources.

A HIA must be done under the following circumstances:

- a. The construction of a linear development (road, wall, power line, canal etc.) exceeding 300m in length;
- b. The construction of a bridge or similar structure exceeding 50m in length;
- c. Any development or other activity that will change the character of a site and exceed 5 000m² or involve three (3) or more existing erven or subdivisions thereof;
- d. Re-zoning of a site exceeding 10 000 m²; or
- e. Any other category provided for in the regulations of the SAHRA or a provincial heritage authority.

A HIA was therefore conducted since the character of the site will be changed. No sites of heritage significance were found. Sites 1 (iron age / historical stone packed circle) & 3 (iron age / historical stone walling) have low cultural significance and the description in specialist report is seen as sufficient. Site 2 (stone monolith) is of medium cultural significance and should therefore be included in the heritage register. A permit application is required to remove the stone.

5.9 Other documents

The following documents were also considered:

- Rustenburg Spatial Development Framework (SDF), North West, 2010 to determine if the project is in line with spatial development plans and environmental management frameworks developed by the municipality. In the process of being updated.
- MPE Environmental Management Framework (EMF) and Plan.
- North West Biodiversity Sector Plan, 2015.
- Department of Environmental Affairs (DEA), 2017. Integrated Environmental Management Guideline. Guideline on need and desirability. ISBN 978-0-9802694-4-4.
- DEA, 2017. Public participation guideline in terms of NEMA, 1998 EIA regulations. ISBN 978-0-9802694-2-0.

- Magaliesberg Biosphere (NPC 2012/047491/08), Introducing Magaliesberg Biosphere Zones – A reference to guidelines for developments in the Magaliesberg Biosphere and the Magaliesberg Protected Environment.

6 ENVIRONMENTAL SETTING

6.1 Socio-economic Environment

6.1.1 Overview

Province:	North West
District Municipality:	Bojanala Platinum District Municipality (BPDM) The RLM with the Local Municipalities of Madibeng, Kgetlengriver, Moses-Kotane and Moretele forms part of the BPDM. The BPDM is responsible for the planning and administration of district-wide infrastructure provision and development matters (RLM, 2010).
Local Municipality:	Rustenburg Local Municipality (RLM) The RLM is responsible for the planning and administration of infrastructure and development located within the boundaries of the Municipality. This includes the preparation (or preparation on their behalf) of all legally required documents for the planning, provision and control of infrastructure and spatial development. These include a Spatial Development Framework (SDF), Integrated Development Plan (IDP), Integrated Transport Plan, Water Services Development Plan, Disaster Management Plan and others (RLM, 2010). Area: 342 061ha Natural areas: 208 171ha (60.9%)

RLM is accessible to major South African urban centres such as Johannesburg and Tshwane (Pretoria), both of which are located approximately 120 km from Rustenburg (RLM, 2010).

Rustenburg is linked to the above urban centres through an extensive regional road network. The most notable of these is the N4 freeway or Platinum Corridor, which links Rustenburg to Tshwane (Pretoria) to the east and Swartruggens and Zeerust to the west. The R24 links Rustenburg to the N14 and Johannesburg to the south and the Pilanesberg to the north (RLM, 2010). ***The project area is located along the R24.***

Three (3) administrative bodies operate and have jurisdiction within the RLM or part thereof. These are the BPDM, the RLM, and the Royal Bafokeng Administration (Rustenburg Local Municipality, 2010).

6.1.2 Population

The total population has increased from 395 000 in 2001 to nearly 450 000 in 2007. This represents an increase of 13.6% over this period and thus implies an annual growth rate of approximately 2.3%. A notable feature is that the growth in the number of households

(25,6%) was nearly double that of the population figures, translating into a household growth rate of 4.3% per annum. This figure may imply that many extended households who have possibly lived in single dwellings have established themselves as separate households over this period, hence the large growth in households. A further possible explanation may be that many of the single male population employed by the mining sector in the area may have been joined by their families over the analysis period. Approximately 84% of the RLM population can be classified as urbanized, residing in either urban or rural settlements. Only 10% of the total population lives on farms (RLM, 2010).

According to the 2001 census information, a total of 80 818 people have relocated in the period between 1996 and 2001. This represents approximately 20% of the 2001 population. These migration movements, however, also include movements within the provincial boundaries. The total number of people relocating between 2001 and 2007 was 10 7862 (representing approximately 24% of the 2007 population). The majority of the population in RLM who relocated, represents internal movements within the province. Internal relocations within the province accounted for 64% of all migration to Rustenburg in the period 1996 to 2001 and increased to 72% over the period 2001 to 2007. The main source of immigrants from outside the provincial boundaries over the period 1996 to 2001 was from the Eastern Cape and Gauteng, both representing 11% of immigrants to the Rustenburg area. These two (2) provinces also remained the main source of immigrants over the period 2001 to 2007 during which 8% of immigrants originated from Gauteng and 6% from the Eastern Cape (RLM, 2010).

Olifantsnek has a population of 204 people in 92 households.

Age Structure

The population profile is dominated by people in the young economically active age category from 21 to 35. Nearly 33% of the total population falls within this age category, a figure substantially higher than the comparative District figures. This pattern may be the result of the high concentration of economic activities and hence employment opportunities in the Rustenburg area, thus attracting a significant proportion of the population in the economically active age categories. The comparative figures for 2001 and 2007 also indicate that the proportion of the population in the age category between 21 and 35 has further increased. The proportion of the population between 41 and 55 years of age have also increased notably over the same period (RLM, 2010)

Gender Composition

The gender structure is male dominated with approximately 57% of the total population represented by males. This is probably associated with the economic characteristics of the area which is dominated by the mining sector. The economic analysis clearly indicates that the vast majority of employment opportunities in the mining sector is occupied by male population, thus resulting in the gender structure (RLM, 2010).

Education

It is generally recognized that the skills profile of a particular area has a significant influence on the economic performance and growth of that region. Significant progress has been made with the eradication of adult illiteracy (decreasing from proximately 12% to 6.7%). The majority of the adult population have only completed some form of secondary education as highest qualification (representing just over 40% of the total adult population). Although some progress has been made with the percentage of adults who have completed a certificate or diploma (6% by 2007) and those with degrees (2.2% of the 2007 population) this still represents a very low proportion of the adult municipal population (RLM, 2010).

The project aims to establish a high school (secondary education facility) with adequate capacity thereby also making space available for more scholars in the primary school.

Employment and Occupation

The dominance of the mining sector in the local economy of the RLM indicates that more than 50% of the employed economically active population were involved in the mining sector by 2007. The total number of people employed in this sector has increased from 57 212 in 2001 to 64 861 by 2007. The most notable other sectors is the wholesale and retail trade sector which by 2007 accounted for 10.8% of the employed population (13 962 people) and the community, social and personal services sector representing 12% of the employed population (15 490 people). This information also indicates that the proportional contribution of the various economic sectors to employment have not dramatically changed between 2001 and 2007. A further important aspect to note is that, despite the large rural areas in the RLM, the agricultural sector only accounted for 3.4% of the employed population by 2007 (RLM, 2010). Retrenchments in the mining industry subsequent to these figures are not available but have resulted in a large increase in unemployment.

Economic Structure

The economic structure relating to formal employment is hugely different between the male and female sector of the population. Unlike its male counterparts, the mining sector only accounted for 11.1% of the employed female population by 2007. Although still a relatively low figure, it did however increase notably from the 7.7% in 2001. The main sources of employment for the employed economically active female population is the wholesale and retail trade sector (20.7% in 2007) and the community, social and personal services sector (30.5%). The total number of women employed in these two sectors respectively in 2001 and 2007 is 5 925 and 8 725. A total of 4 180 women are employed in the financial and business services sector which represents a significant 14.6%. Conversely, the male population is substantially dominated by the mining sector with more than 61% of the employed male population involved within the mining sector (translating to a total of 61 672 males employed in this sector by 2007). The most notable other economic sector as source of employment for the male population is the wholesale and retail trade sector (8% of the male population). The low percentage (2.6%) of the male population involved in the agricultural sector is also notable (RLM, 2010).

The spatial concentration of economic activities are concentrated mainly along the mining belt stretching from Marikana in the east through Rustenburg up to the Boschoek area in the north western parts of the municipality. The levels of economic activity in the north eastern and southern parts of the municipality are very insignificant compared to the rest of the municipal area. This area also coincides with the highest levels of accessibility to employment (in excess of 25 000 employment opportunities within a 30 minute driving time) in the central parts of the municipality. In contrast, the estimated number of employment opportunities within 30 minutes driving time in the north eastern and southern parts of the municipality is generally below 1 000. This information implies that the economic strength of the municipality is not equally spread across the municipal area and is largely associated with the location of the mining activities in the central and northern parts of the municipal area (RLM, 2010).

Unemployment

The estimated unemployment rates in the RLM have decreased from 31.8% in 2001 to 28.2% in 2007. These figures are substantially lower than the comparative district unemployment rate, which decreased from 40.8% to 33.7% over the same period. A further notable feature is the significant differences between the levels of unemployment between the male and female population. The unemployment rate of the male population in 2007 was

18.1%, compared to the 46.3% of the female population (more than double the unemployment rate of the male population) (RLM, 2010). Subsequent retrenchments in the mining industry have resulted in a large increase in unemployment.

6.1.3 Land use

Various types of commercial and industrial development are proposed in the Municipal and Local Spatial Development Frameworks to support spatial economic development opportunities within the municipal area (RLM, 2010).

The Magaliesberg Mountain Range traverses the Municipal Area south of Rustenburg from east to north-west. This mountain range has influenced the existing settlement pattern due to the fact that it has limited urban expansion in a south-westerly direction. The result is that urban expansion has mainly occurred in a northern and north-eastern direction (RLM, 2010). ***Olifantsnek and this project area is south of Rustenburg.***

The urban pattern that was shaped by the centrality function of Rustenburg, the Magaliesberg buffer, the accessibility of major roads and the impact of the mining belt, is radial with Rustenburg as the core area and three (3) urban corridors extending from it in a northerly, north easterly and westerly direction. It is evident that the major towns located within the Municipal Area are functionally linked to Rustenburg. This functional linkage expresses itself by the movement of people between these towns and the economic opportunities located in Rustenburg. These functional linkages extend over socio-political boundaries such as the Bafokeng Magisterial Boundary (RLM, 2010)

6.1.4 The project

Current social contributions by the existing school:

- Education: REC operates a Private English Primary and Secondary Boarding School in Olifantsnek since 2005 to accommodate students from Olifantsnek and surrounding areas. The closest alternative English school is 13km from here.
- Recreational: In 2015, REC developed a sports field on Erf 45 at a cost of R2 billion. The facility is maintained at high standard by REC. Facility is open to all residents free of charge and it is often used for recreational purposes and preparation of sport events. REC incurred significant legal expenses due to opposition by OCHOA.
- Employment: REC employs 67 people on a full time basis. 13 employees reside in Olifantsnek as homeowners or tenants. 11 employees reside on school property or rent apartments in Olifantsnek. Two households benefit directly through services rendered to the school.
- Water: Supplied water to residents free of charge when community borehole has been out of service.
- Roads: REC tarred Machol road (corner Stubb Street to entrance of school) at own cost and maintain at own cost. At times, REC grades (TLB) down Stubb Street and Main Street to the Boarding entrance.
- Security: REC has two full time security guards which patrol REC properties and roads surrounding at night. Improve security of own properties as well as 18 bordering erven.
- Aesthetics: REC ground staff maintains Olifantsnek entrance at own expense (lawnmovers, bush cutters) and collect litter.
- Economics: REC pays RLM a considerable amount in rates and taxes. Sadly the services are not provided by RLM.

Education: New state of the art education facilities will be established.

Accessibility: The project area is located along and to the east of the R24. Access will be directly from the Third Avenue, which enters the Olifantsnek area off the R24.

Financial investment: The project requires a R 50 million capital investment.

Job creation/employment: The project will create 60 jobs during the construction phase and 40 - 60 permanent jobs during the operational phase.

Security: The area is heavily burdened by poaching and thoroughfare (noted during site visit). Development on this portion will improve security and restrict these activities.

Need: The new school will be able to enrol 600 scholars and provide boarding to 300 of these pupils. The current premises (4.3ha) is not large enough to accommodate both a primary and high school since the Department of Education requires 4ha per school. The aim is therefore to establish a high school on the new premises and allow the existing premises for only the primary school.

6.2 Biophysical environmental overview

<p>Climate: Precipitation:</p>	<p>Summer Rainfall Climatic Zone. Weather Bureau section number: 0511. Rainfall zone: A2F. Rainfall station: 0511467, 2km east of site Rainfall pattern: Typical summer thunderstorms with heavy lightning and strong winds. Rainfall period: October - April (90.75% of rainfall) Dry period from May to September (winter). Mean Annual Precipitation (MAP): 711mm (1924 – 1989)</p>																				
<p>Climate: Evaporation:</p>	<p>Evaporation zone: 3B Evaporation station: A2E008, 15km north of site Mean Annual Evaporation (MAE): 1 645mm (S-pan) and 2 054mm (A-pan) for 1957 to 1979</p>																				
<p>Climate: Temperature:</p>	<p>Temperature varies between extremes of -6°C and 40°C with an average of 19°C. Summer (October to March): 16°C - 31°C with a daily average of 23°C. Winter: 3°C - 24°C with a daily average of 12°C. Average annual temperature: 18.7°C</p>																				
<p>Topography:</p>	<p>Highest point on project area: 1 235 metres above mean sea level (mamsl); southeast corner and along the western boundary (R24). Lowest point on project area: 1 216 mamsl; south western corner. Gradient: Fall of 19 m over roughly 315 m or 465 m. 1:17 – 1:25</p>																				
<p>Geology (HK) Geohydrological Services, 2019):</p>	<p>1:250 000 Geological Series 2526 Rustenburg Slate, shale and hornfels of the Pretoria Group</p> <table border="1" data-bbox="520 1303 1385 1608"> <thead> <tr> <th><u>Era</u></th> <th><u>Group</u></th> <th><u>Formation</u></th> <th><u>Lithology</u></th> <th><u>Colour</u></th> </tr> </thead> <tbody> <tr> <td>QUATERNARY</td> <td></td> <td></td> <td>Surface deposits</td> <td>Q</td> </tr> <tr> <td>MOKOLIAN</td> <td></td> <td></td> <td>Diabase</td> <td>di</td> </tr> <tr> <td>VAALIAN</td> <td>Pretoria Group</td> <td>Silverton</td> <td>Slate, shale, hornfels</td> <td>Vsi</td> </tr> </tbody> </table> <p>Boreholes: Boreholes are located in the contact zone of the Silverton formation, which is the slate and shale host rock and the quaternary deposits. The quaternary deposits are expected to form a productive storage of water, which replenish fast after and during the rainy season.</p>	<u>Era</u>	<u>Group</u>	<u>Formation</u>	<u>Lithology</u>	<u>Colour</u>	QUATERNARY			Surface deposits	Q	MOKOLIAN			Diabase	di	VAALIAN	Pretoria Group	Silverton	Slate, shale, hornfels	Vsi
<u>Era</u>	<u>Group</u>	<u>Formation</u>	<u>Lithology</u>	<u>Colour</u>																	
QUATERNARY			Surface deposits	Q																	
MOKOLIAN			Diabase	di																	
VAALIAN	Pretoria Group	Silverton	Slate, shale, hornfels	Vsi																	

Soil (Rocksoil Consult, 2019)	Test pits: 10		
	Geotechnical zonation:	Zone 1: S1-H1/2BCD (2F)	Zone II: S-H/2BCDF
	Soil profile:	Shale	Diabase
	Material succession:	Thin topsoil overlying silty sandy residual shale becoming highly jointed, laminated weathered shale bedrock.	Thin topsoil overlying coarse diabase gravel to corestones, mostly clast-supported in a silty to clayey matrix.
	TLB Refusal:	1.20 – 1.90 m below surface	1.20 m below surface

Soil classes:
Unified Soil Classification System:

- Highly weathered shale
 - GM (course-grained soils, gravels, gravel with fines, silty gravels, gravel-sand-silt mixtures).
 - GC (course-grained soils, gravels, gravel with fines, clayey gravels gravels, gravel-sand-clay mixtures).
- Residual shale
 - ML (fine-grained soils, silts and clays with liquid limit of \leq 50%, inorganic silts, very fine sands, rock four, silty or clayey fine sands).
 - CL (fine-grained soils, silts and clays with liquid limit of \leq 50%, inorganic clays of low to medium plasticity, gravelley/sandy/silty/lean clays).

AASHTO Classification:

- A-2 (granular materials, different LL and PI for A-2 variances with significant constituent: silty or clayey gravel sand)
- A-4 (silt-clay material, LL max of 10 with significant constituent: silty soils).
- A-6 (silt-clay materials, LL max of 40, PI min of 11 with significant constituent: clayey soils).

Corrositivity: Mildly to highly corrosive to cement and steel.

Seepage: Soils profiles are slightly moist, indicating no sudden or substantial change in moisture content with depth or across the site.

No concerns in terms of:

- Collapsibility or seismic activity
- Unstable or steep natural slopes
- Dolomite stability or undermining
- Expansiveness (scattered occurrences may be anticipated between diabase corestones and in diabase residuum)

Erodibility: Erodible if subject to concentrated water flow.

Constraints: Highly variable excavation conditions and high likelihood of waterlogging in upper soil horizons coupled with periodical seepage in shallow soil horizons.

Geohydrology (groundwater) (HK Geohydrological Services, 2019)

Groundwater flow direction: South eastern direction towards Olifantsnek Dam

Hydrocensus:

- 24 boreholes visited.
- 6 boreholes on property (Portion 62) but only two (2) equipped and used (BH1 & 2). Third borehole (BH3) to be re-equipped for use (equipment stolen in 1996).
- Water level depths: 7.03 to 36.05 mbgl.
- Two (2) recently pumped boreholes had water depths of 62.47 and 73.02 mbgl.
- 17 of the 24 boreholes are in use.

Test pumping:

BH No.1 BH Depth & Static Water Level	Step Test				Constant Discharge Test			Comment on the Water Level Recovery Rate of the Constant Discharge Test
	Step No.	Rate (l/s)	Dur. (min)	D/D (m)	Rate (l/s)	Dur. (min)	D/D (m)	
BH 1 Depth: 55m Static water level:14.80m Date tested: 18 July 2019	1	1.40	30	1.97	1.40	1800	27.80	100% in 40 min. Very fast recovery.
	2	2.01	30	16.12				
BH 2 Depth: 56m Static water level:15.20m Date tested: 12 July 2019	1	0.60	30	12.22	0.75	1440	14.07	100% in 90 min. Very fast recovery.
	2	1.25	30	28.42				
BH Backup Depth: 49.5m Static water level:9.8m Date tested: 19 July 2019	1	0.75	10	0.80	0.70	360	14.80	100% in 60 min Very fast recovery.
	2	1.10	30	11.77				
ST - Step Test				Dur. – Duration				
CDT - Constant Discharge Test				D/D – Draw down				
SWL - Static Water Level in metres below ground level								

Groundwater quantity:

Requirement for school: 56.1m³/day (20 477m³/annum) – confirmed by EPS Consulting Engineers Services report calculations (Report 5381SR01 of October 2019).

Boreholes to be used: BH1, 2 & 3 on property (Portion 62) but west of R24 (pipe infrastructure exists to convey water to project area).

Recharge: 46.6mm/a or 6.6% of MAP or 36.92m³/day.

Scale of abstraction: > 100% (Category C study conducted – large scale abstraction)

Groundwater recharge to the north and west will also flow towards the boreholes. The production boreholes can therefore also make use of this recharge which is 1 696 240m³/day.

Recommended abstraction:

Borehole	Recommended abstraction rate:		Dynamic water level:
	12hours/day	m ³ /day	
BH1	0.5	21.6	±40
BH2	0.6	25.9	±16
BH3	0.2	8.6	±12
TOTAL		56.1	

The recommended abstraction figures were scaled down to make provision for borehole interference with other boreholes in the area.

Groundwater quality (SANS 241-1 & 2):

- Chemical: Below standard SANS 241: 2015 Drinking Water limits. No treatment required. TDS of 379 – 447 mg/l.
- Bacteriological:
 - No contamination in BH2 and BH3. No treatment required.
 - Faecal Coliform count for BH1 is 2/100ml. Chlorination required prior to human consumption.

Groundwater quality pollution risk:

Sand and silt have minimal to medium capacity to absorb contaminants but medium to high capacity to create an effective barrier to the movement of biological contaminants.

Aquifer:

Classification: Minor - moderate yielding aquifer system of variable water quality.

Vulnerability: Least tendency.

Susceptibility: Low.

Groundwater Quality Management Classification (GWQM): 2 with low protection level needed.

Medium Risk - Low risk and medium to long distance to water table (10 to 15 metres surface to aquifer). Vulnerable to inorganic pollutants but with negligible risk of organic or microbiological contaminants. Medium capacity to absorb contaminants and a medium to high capacity to create an effective barrier to the movement of biological contaminants (soil weather to clayey matrix with low permeability).

Infiltration rate: 0.25m/day – risk is therefore negligible (40 days to reach aquifer).

Groundwater use in the area:

- Filling station (2 boreholes) – Pretorius
- Farming (3 boreholes) – Dreyer, Graham
- Household / domestic (6 boreholes) – Minnie, Engelbrecht, Page, Hurn, Dreyer
- Olifantsnek area (village)
- Rainbow Chickens (5 boreholes, only 2 are used) - supplied with water via a pipe as well.
- Existing school (3 boreholes) – 44m³/day for human consumption (school, and 3 other erven) plus 10 - 20m³/day (dry season) for sports fields (borehole with sulphur).

<p>Surface Environment:</p>	<p>Water</p> <p><u>Water Management Area (WMA):</u> 1 Limpopo (previously Crocodile (West) and Marico) Upper Hex River, which is a tributary of the Crocodile River. Quaternary catchment: A22G</p> <p><u>Runoff:</u> Direction: South east towards Olifantsnek Dam Hydrozone N Mean Annual Runoff (MAR): 20 – 50mm</p> <p><u>Closest water bodies:</u> Olifantsnek Dam: ± 800m east of the property and project area with houses between. Spruit: ±300m south of property and project area.</p> <p><u>Surface water uses in the area:</u></p> <ul style="list-style-type: none"> • Olifantsnek Irrigation Board – irrigation canals to supply farmers with water from the Olifantsnek Dam.
<p>Flora (TBC, 2019):</p>	<p>Biome: Savanna Vegetation type: Moot Plains Bushveld classified as Vulnerable (Mucina & Rutherford, 2006). Ecosystem: Least Threatened and Poorly Protected</p> <p>No SCC of the expected 293 plant species were found.</p> <p><u>Habitats (refer to Figure 6-1):</u></p> <ul style="list-style-type: none"> • Transformed – little to no natural areas left due to transformation. • Degraded – used as an agricultural field in the past with some recovery. • Secondary bushveld – disturbed from natural state (semi-natural) with sections of bare soil due to over-grazing and anthropogenic activities. <p>The project area has a moderate sensitivity due to the remains of Secondary Bushveld.</p> <p><u>Alien and invasive species:</u> Six (6) Category 1b invasive plant species were recorded:</p> <ul style="list-style-type: none"> • <i>Argemone ochroleuca</i> • <i>Cereus jamacaru</i> • <i>Datura ferox</i> • <i>Eucalyptus camaldulensis</i> • <i>Melia azedarach</i> • <i>Opuntia ficus-indica</i>
<p>Fauna (TBC, 2019):</p>	<p><u>Avi-fauna:</u> The project area falls within the Magaliesberg Important Bird Area (IBA). Of specific international importance is the Cape Vulture and Secretary Bird. However, due to the size of the IBA and the project area habitat, none of the species have a high likelihood to occur.</p>

Seventeen (17) bird species were identified during the site visit but no SCC.

Nineteen (19) of the 366 expected bird species in the project area are listed as SCC.

Species:	Conservation Status (IUCN, 2017):	Likelihood of occurrence:
<i>Alcado semitorquata</i> (Half-collared Kingfisher)	Least Concerned (LC)	Moderate
<i>Aquila rapax</i> (Tawny Eagle)	LC	Low
<i>Aquila verreauxii</i> (Verreaux's Eagle)	LC	Moderate
<i>Ciconia abdimii</i> (Abdim's Stork)	LC	High
<i>Ciconia nigra</i> (Black Stork)	LC	Low
<i>Circus raivorus</i> African Marsh-harrier	LC	Low
<i>Coracias garrulous</i> (European Roller)	LC	High
<i>Eupodotis senegalensis</i> (White-bellied Korhaan)	LC	Low
<i>Falco biarmicus</i> (Lanner Falcon)	LC	High
<i>Glareola nordmanni</i> (Black-winged Pratincole)	Near Threatened	Moderate
<i>Gyps africanus</i> (White-backed Vulture)	Critical	Moderate
<i>Gyps coprotheres</i> (Cape Vulture)	Endangered	Low
<i>Mycteria ibis</i> (Yellow-billed Stork)	LC	Low
<i>Oxyura maccoa</i> (Maccoa Duck)	Near Threatened	Low
<i>Phoenicopterus ruber</i> (Greater Flamingo)	LC	Low
<i>Ploemaetus bellicosus</i> (Martial Eagle)	Vulnerable	Low

	<p><i>Rostratula benghalensis</i> (Greater Painted-snipe)</p>	<p>LC</p>	<p>Moderate</p>
	<p><i>Sagittarius sepentarius</i> (Secretarybird)</p>	<p>Vulnerable</p>	<p>Low</p>
	<p><i>Sterna caspia</i> (Caspian Tern)</p>	<p>LC</p>	<p>Low</p>
	<p><u>Mammals:</u> Only the following SCC have a moderate to high likelihood of occurrence within the project area:</p> <ul style="list-style-type: none"> • South African Hedgehog (High) • African Straw-coloured Fruit Bat • Brown Hyena • African Striped Weasel <p>Only four (4) mammal species were identified during the site visit but no SCC.</p> <ul style="list-style-type: none"> • Black-backed jackal • Cape porcupine • Scrub Hare • Tree squirrel <p><u>Reptiles:</u> No SCC are likely to occur on site. None identified during the site visit.</p> <p><u>Amphibians:</u> The Giant Bullfrog can occur on the site.</p>		
<p>Sensitivity:</p>	<p><u>Magaliesberg Protected Environment (MPE):</u> Project area is outside of the MPE. MPE is 500m north of project area.</p> <p><u>Magaliesberg Important Bird Area (IBA):</u> See above under Fauna.</p> <p><u>Magaliesberg Biosphere Reserve (MBR):</u> UNESCO – international conservation significance Protected Area Category: Type 4 Size: 358 822ha Project area is located within the buffer zone. Buffer zone: Development is evaluated based on certain evaluation criteria.</p> <p><u>Critical Biodiversity Area (CBA):</u> Property is located within CBA2.</p> <p><u>Ecological Support Area (ESA):</u> Property is located within ESA1.</p>		

<p>Heritage & cultural:</p>	<p>No sites of heritage significance found.</p> <p>Sites 1 (iron age / historical stone packed circle) & 3 (iron age / historical stone walling) have low cultural significance, description in specialist report is seen as sufficient.</p> <p>Site 2 (stone monolith) is of medium cultural significance and should therefore be included in the heritage register. A permit application is required to remove the stone.</p>
<p>Palaeontological (Durand, FJ, 2019):</p>	<p>Due to contact thermal metamorphosis caused by the intrusion of Diabase and Bushveld Igneous Complex rocks into the Transvaal Supergroup, the chances of finding intact fossils of bacteria and microbial mats in these sedimentary rocks are very small.</p>

6.3 Supporting information

Appendix E contains copies of the specialist studies.

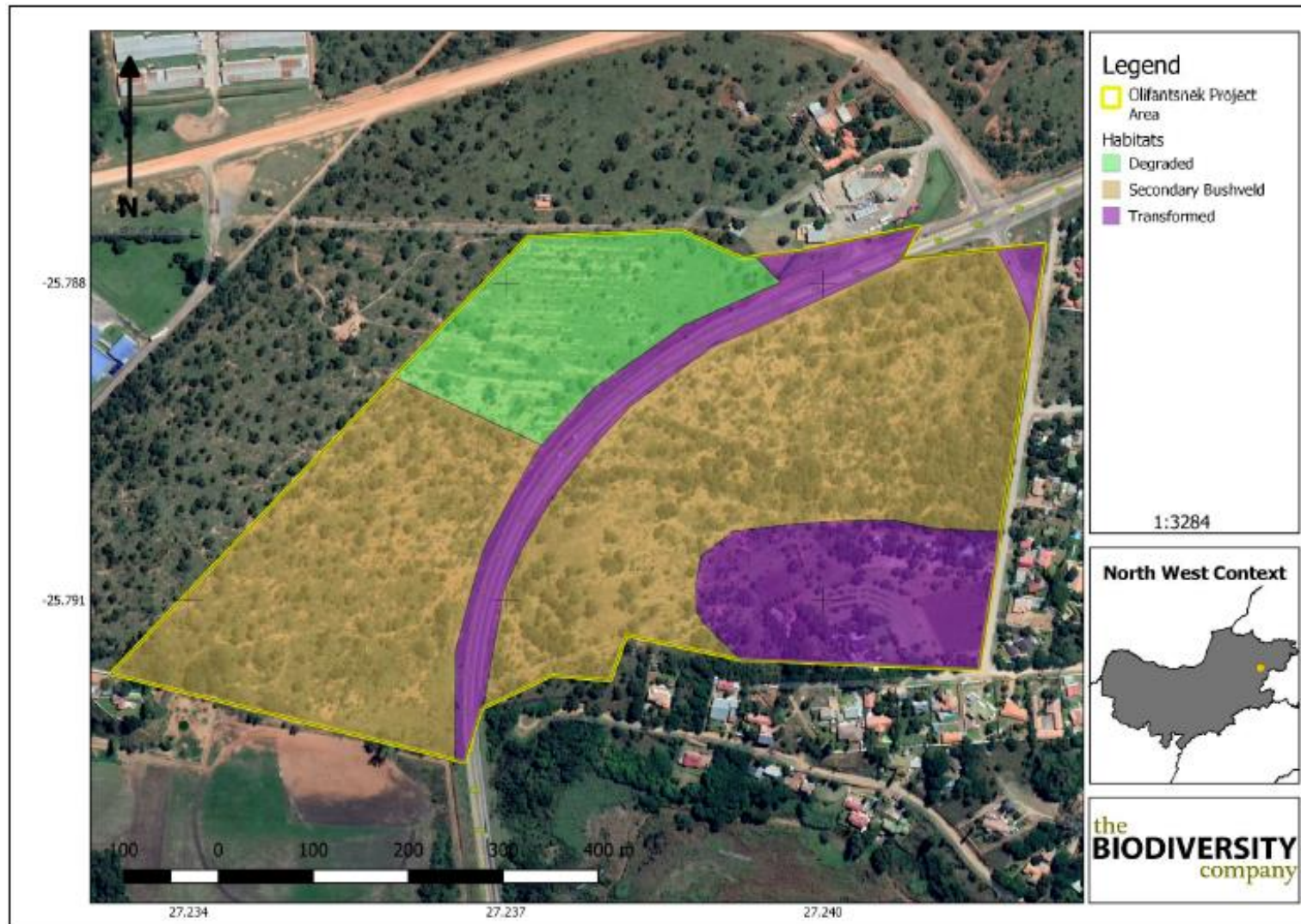


Figure 6-1: Habitats identified (TBC, 2019)



Figure 6-2: Habitat sensitivity (TBC, 2019)

7 ALTERNATIVES CONSIDERED

7.1 Site alternative

7.1.1 Preferred site

Property: The preferred property is Remainder of Portion 62 (a portion of portion 46) of the farm Commissiesdrift 327JQ, Olifantsnek, Rustenburg Local Municipality, North West Province.

Project area: The property is split into two (2) portions due to the R24 road, which cuts through it. The preferred site / project area is ± 15 ha in size and located east of the R24.

7.1.2 Alternative properties

No alternative properties have been considered for this project due to the following:

- This property is owned by the school and already accommodates some of the school staff.
- The property has not been subdivided and can be used as a unit for one particular land use.
- The property is mostly vacant except for the four (4) staff houses and equestrian area (underutilised).
- The property is in close proximity to the existing school (simplify management).
- The property is conveniently located along the R24 (Rustenburg – Johannesburg road) 15km from the Rustenburg CBD for easy accessibility.
- The property is not too close to the Olifantsnek Dam (>700m) in terms of environmental sensitivity.
- The property is not close to the Olifantsnek Dam, which will be prime residential property but directly east of the R24 road.
- This portion of the property is large enough (± 15 ha) for the planned development because a large enough surface area is required to accommodate the school, boarding facilities and sports fields.
- A large area of Olifantsnek has already been developed (residential, existing school and sport grounds) and is not available for new developments.
- Most other vacant stands in Olifantsnek are too small and only for residential purposes (see below).

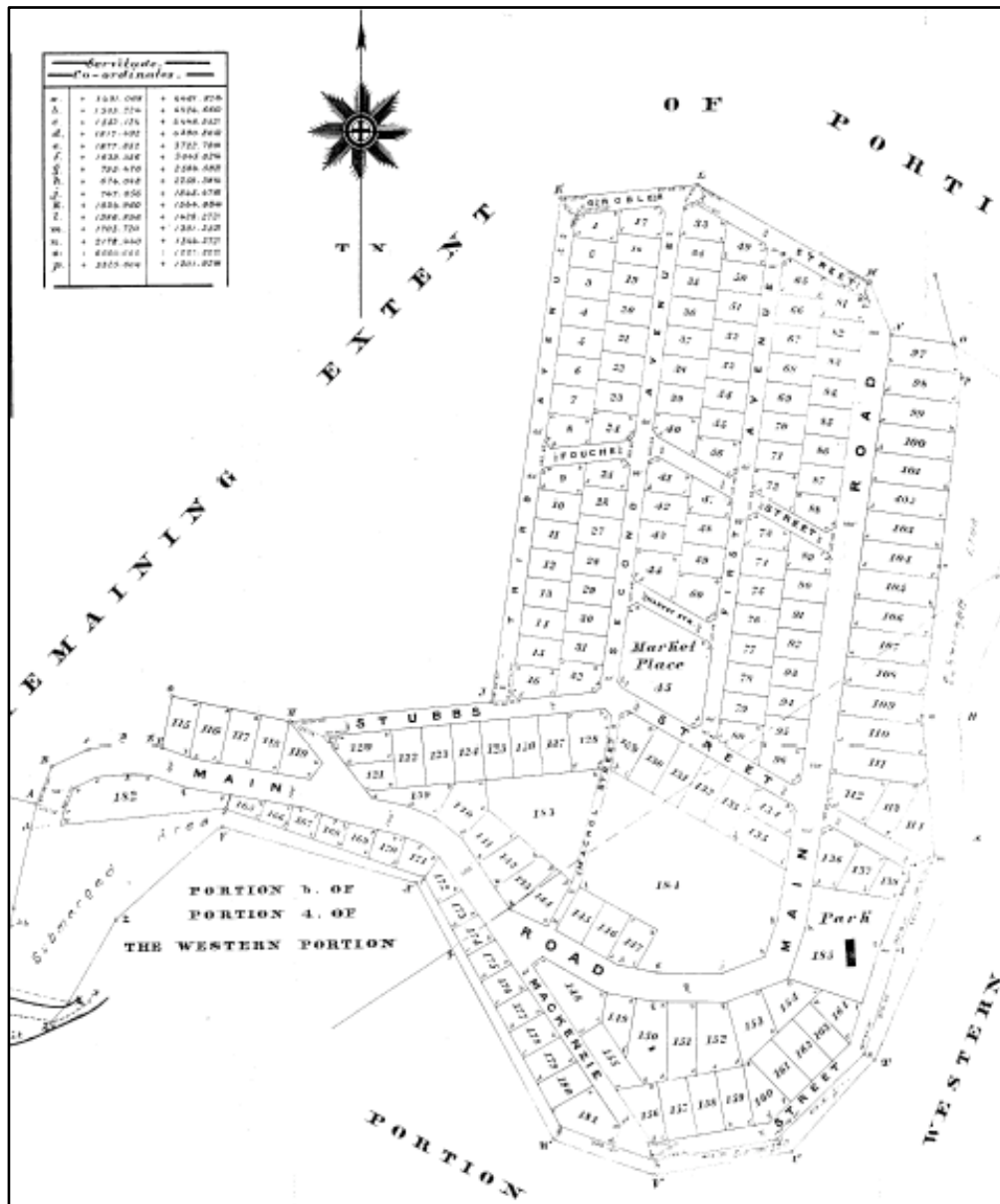


Figure 7-1: Olifantsnek Town and erven

7.1.3 Alternative project area

The preferred project area (east of the R24) is most suitable due to the following:

- This portion of the property is located between the Olifantsnek residential area and the R24 in an already developed area.
- This portion of the property is located within close proximity to the primary school.
- The other portion of the property is located in close proximity to a filling station (could be seen as a risk).
- The other portion of the property is in a more undeveloped agricultural area to the west of the R24
- The project area is conveniently located along the R24 (Rustenburg-Johannesburg road) with high visibility and within easy reach for visitors and people not familiar with the area (sport / school events).

- The project area is easily accessible from an existing road, namely Third Avenue off the R24, which also provides access to the Olifantsnek residential area. Therefore no new roads are required. The bus and delivery entrance will be from the existing circle (traffic control).
- The project area is conveniently accessible from a surfaced road (Third Avenue), which reduces dust pollution because most other roads in Olifantsnek are dust roads.

7.2 Land use alternative

7.2.1 Preferred land use – School with associated sports fields and support structures

The property falls within the Olifantsnek area of RLM. Also refer to need and desirability.

7.2.2 Agricultural

The land use zoning is agricultural and a small portion is currently used for equestrian purposes. A large portion of the property is vacant and not utilised (>80%). The property is therefore underutilised. The R24 cuts through the property and splits the property in two (2) portions. The portion to the west of the R24 is still available for agricultural purposes if there is a need since the land use to the west of the R24 is mostly agricultural.

7.2.3 Other - Residential

The property can be used for residential development as per the SDF but will have to be sub-divided and rezoned. The school will then have to establish the high school on the other side of the R24 in a mostly agricultural land use area or purchase another property for this purpose. There is no municipal water supply or sewage management in Olifantsnek and a large number of residential properties (± 150) across the ± 15 ha will put additional strain on the natural resources. This option was therefore not further assessed.

7.3 Layout alternatives

7.3.1 Preferred layout

The layout was dictated by access points (existing entrance and location of existing circle), existing structures (houses) and surface areas required for different purposes – sport fields versus buildings (class rooms). The original layout (Layout 1 below) was revised (adapted) to address traffic flow concerns raised by the Olifantsnek community in terms of the access to allow for more parking and movement of busses/vehicles within the property (grey areas added) to not disrupt the community traffic in Third Avenue. Layout 2 is therefore the preferred option to reduce traffic impacts on the community.

Two layouts were considered:



Layout 1: Original

Layout 2: Preferred – adapted layout 1

7.4 Waste removal services

7.4.1 Municipal

The RLM does collect waste from the Olifantsnek area, on a Friday.

7.4.2 Contractor

See the letter provided in Appendix G. Van der Westhuizen contractors currently collect the existing school's solid waste twice a week and have the capacity to handle the collection from the new premises as well (registered to dispose to Rustenburg Municipal landfill – card 6.184.314).

7.5 Water supply

7.5.1 Municipal

There is no municipal water supply to Olifantsnek area. This option was therefore not further assessed.

7.5.2 Groundwater

The Olifantsnek residential area is supplied with water from a borehole and this is the only water supply option in the area for potable water. The school will also use boreholes (BH1, 2 & 3) for water supply purposes (56.1m³/day) and the geohydrological study has shown that the boreholes can be used based on yield (quantity) and quality (pumped with a back-up generator). Borehole BH1, however, has to be chlorinated prior to use for human consumptions due to Faecal coliforms detected. Refer to Appendix E.

The groundwater abstraction and use (Section 21(a)) triggers a water use license application (WULA) in terms of the NWA. Such application has been initiated on the DWS on-line system (eWULAas) and a pre-application consultation requested (Phase I of application completed – pre-application submission). See Appendix G (Reference: CT11664).

7.5.3 Rand Water pipeline to Rainbow Farms

Though initial indications were that there was no water available from this source, many people indicated it as a potential water source though at the same time indicating that there was no water available. This source was therefore also included and HydroScience engaged with Mr Elvin Johnson who referred us to Mr Anton van der Nest. Numerous telephone conversations took place with Mr van der Nest and email communication was sent on 20 September 2019. On 14 October 2019, it was confirmed by Mr Anton van der Nest, that though they previously had surplus water, they were now under pressure from Rand Water to cut down on their volumes (especially the last two weeks) and expected further cuts. It was therefore not possible to supply the school with any amount of water.

7.6 Sewage management

7.6.1 Municipal

There is no municipal sewage management in Olifantsnek. Though there has been an attempt to establish a sewage treatment plant (STP) for the area, nothing ever came of it and the status is currently unknown. Linking to a municipal sewer would have been the preferred option but it is not currently possible.

7.6.2 Septic tanks and French drains

This is a very basic on-site wastewater treatment method used on farms for example due to the distance from formal Waste Water Treatment Works (WWTW), the lack of municipal services and infrastructure, distance from other water users who may be impacted and limited treatment capacity required (low loading from limited number of people). Refer to CSIR, 1996 document BOU/R9603. The following should be considered:

- A septic tank (water tight) is the first step of this system that feeds into a secondary system such as a French drain.
- The most important factor in the performance of a septic tank is the rate at which sewage moves through the tank. This controls the retention time of the liquid inside the tank and therefore the extent of treatment through biological activity.
- Other factors considered for performance includes storage capacity, tank geometry and configuration, loading pattern, inlet and outlet arrangement, number of compartments and importantly, maintenance.
- The separation and sedimentation of suspended solids is a mechanical process.
- Sludge layer at bottom (solids and partially decomposed matter becomes compacted), floating scum on top and clear liquid in between.
- Organic matter in the sludge and scum is degraded (over time) by anaerobic bacteria (bacteria functioning in an environment lacking oxygen). Scum and solids still needs removal over time.
- Due to bacterial action, volatile organic acids (VOCs) are formed which are converted to carbon dioxide (CO₂), methane (CH₄) and water (H₂O). The septic tank therefore requires ventilation to allow gasses to escape.
- The septic tank is responsible for partial digestion of organic matter through an anaerobic (without oxygen) bacteriological degradation (break-down) process.
- A septic tank discharges clarified liquid to a second component (French drain) for further treatment.
- The French drain, a subsurface soil absorption system consisting of layers of sand, gravel and porous material, is the disposal system for liquid / effluent from the septic tank because a large number of micro-organisms from septic tank needs further treatment prior to disposal.

- Percolation into soil is common for small volumes.
- Soil suitability as a long-term absorption field has to be considered.

This option was not considered the best practicable environmental option (BPEO) due to the following:

- Duty of care and environmental responsibility considerations. This is a very basic system with limited treatment and more suitable for households on farms where there are large distances between systems and the loading capacity is low.
- The number of children - 600 scholars during the day and 300 scholars at night results in a higher loading than that generally considered for this type of system.
- Ventilation required due to gas generation and possible odours generated can become a nuisance
- Use of groundwater as a water supply source in the area and the associated risk to groundwater from such a system.
- Additional facility required to remove grease (kitchen etc).
- No foreign material (other than grey water, black water, soaps and detergents and toilet paper) can enter a septic tank as it will not be able to handle/digest other material. Therefore measures are required to prevent such material from entering the system – responsible use or a grit/screen prior to inlet of septic tank.
- Scum and solids still needs removal over time.
- Population in the area already using such a system.
- Risk of groundwater contamination - high load in small area with reduced retention time for biological breakdown.

7.6.3 Conservancy tanks

This involves the storing of sewage in conservancy tanks and then pumping these with a honeysucker. This is costly and only recommended for small volumes since it adds to the waste load at WWTW.

7.6.4 Preferred option - Package STP

Refer to Appendix G for details.

Location: South west corner of site to allow gravitational flow.

Design: 60m³/day to allow for adequate capacity (40.8m³/day sewage generated based on EPS consulting engineers calculation, Report 5381SR01 of October 2019.

Pipes: 160 mm diameter.

Flow: 0.7m/s

Reasons for selection:

- Designed for the final effluent to meet the South African General Limits.
- Successfully implemented at another school (Maratolla school in Hammanskraal)
- Rotating Biological Contactor (RBC) system developed in Germany in 1800s – system therefore around for centuries.
- Pre-manufactured and assembled in factory for easy on-site installation and commissioning.
- Can withstand harsh African conditions due to materials used and construction methods.
- Energy efficient (slow turning mechanical equipment with low power requirements) – 2kW.
- Small, aesthetically pleasing and not noisy (slow turning mechanical equipment with low power requirements).
- Little operating skill requirements (no specialist training required).
- Minimal maintenance (cost and labour consideration).

- Flexible and reliable. Can handle variations / fluctuations (daily or seasonal) in organic and hydraulic loading and still guarantee effluent quality.

The sewage treatment (Section 21(g)) and the use of the treated effluent for irrigation (Section 21(e)), triggers a water use license application (WULA) in terms of the NWA. Such application has been initiated on the DWS on-line system (eWULAas) and a pre-application consultation requested (Phase I of application completed – pre-application submission). See Appendix G (Reference: CT11664).

7.7 STP effluent

7.7.1 Disposal of treated sewage from STP

This option was not assessed as it was not considered the best practicable Environmental Option (BPEO) – see below in Section 7.7.2.

7.7.2 Reuse of treated sewage from the STP

The option was considered the BPEO due to the following:

- Reuse is higher up in the hierarchy than disposal. Disposal is always the last option.
- Large quantities of water will be required for the irrigation of gardens and sport fields to maintain these in a good condition.
- The effluent from the STP is available and of adequate quality (see Table 7-1 below) to be used for irrigation.
- Potable water supplied from boreholes in the area is available in limited quantities and can therefore not be abstracted and used for these purposes as it will significantly increase the water quantity requirements, abstraction and impact on other water users.
- The water quality will comply with the General Limits as presented in Table 7-1 below, which is better than the General Authorisation (GA) Standards for use for irrigation.

Table 7-1: Water quality for STP effluent

Constituent:	General Authorisation (GA) - GNR 665 of 2013 as extended in GNR 383 of 2019:			SANS 241:2015
	Section 21 (e): 50m ³ /day for irrigation	Section 21 (f): General Limit for discharge	Section 21 (f): Special Limit for discharge	
pH	6 - 9	5.5 – 9.5	5.5 – 7.5	5 – 9.7
Electrical conductivity (EC) in mS/m	200	70 above intake	50 above intake	170
Suspended Solids (SS) in mg/l	-	25	10	-
Calcium (Ca) in mg/l	-	-	-	-
Magnesium (Mg) in mg/l	-	-	-	-
Sodium (Na) in mg/l	-	-	-	200
Potassium (K) in mg/l	-	-	-	-
Sodium Absorption Ratio (SAR)	5	-	-	-
Ammonia (NH ₃) in mg/l as N	-	6	2	1.5
Nitrate (NO ₃) / Nitrite (NO ₂) in mg/l as N	-	15	1.5	0.9
Sulphate (SO ₄) in mg/l	-	-	-	500
Chloride (Cl) in mg/l as free chlorine	-	0.25	0	-
Ortho-Phosphate (o-PO ₄) in mg/l as P	-	10	2.5 max	-
Fluoride (F) in mg/l	-	1	1	1.5

Constituent:	General Authorisation (GA) - GNR 665 of 2013 as extended in GNR 383 of 2019:			SANS 241:2015
Chemical Oxygen Demand (COD) in mg/l	5 000	75	30	-
Soap, oil or grease in mg/l	-	2.5	0	-
Arsenic (As) in mg/l	-	0.02	0.01	0.01
Cadmium (Cd) in mg/l	-	0.005	0.001	0.003
Chromium (Cr IV) in mg/l	-	0.05	0.02	0.05
Copper (Cu) in mg/l	-	0.01	0.002	2
Cyanide (CN) in mg/l	-	0.02	0.01	0.2
Iron (Fe) in mg/l	-	0.3	0.3	2
Lead (Pb) in mg/l	-	0.01	0.006	0.01
Manganese (Mn) in mg/l	-	0.1	0.1	0.4
Mercury (Hg) in mg/l	-	0.005	0.001	0.006
Selenium (Se) in mg/l	-	0.02	0.02	0.04
Zinc (Zn) in mg/l	-	0.1	0.04	5
Boron (B) in mg/l	-	1	0.5	2.4
Faecal Coliforms (count/100ml)	100 000	1 000	0	0

The sewage treatment (Section 21(g)) and the use of the treated effluent for irrigation (Section 21(e)), triggers a water use license application (WULA) in terms of the NWA. Such application has been initiated on the DWS on-line system (eWULAas) and a pre-application consultation requested (Phase I of application completed – pre-application submission). See Appendix G (Reference: CT11664).

7.8 No-go alternative

The no-go alternative would be to refuse the school project. This will leave the property largely vacant.

8 PUBLIC PARTICIPATION PROCESS

8.1 Summary

Newspaper notice:	Newspaper: Rustenburg Herald Date of publication: 5 July 2019 Page: 2 Distribution: 32 000 copies/weekly Refer to Appendix F.
Site notices:	Date placed: 9 July 2019 Size: 800 X 600 mm Number of notices: 4 Location 1: Property boundary, entrance to Olifantsnek area, facing R24 (subsequently removed by someone) 25° 47' 16.1" South; 27° 14' 28.2" East Location 2: Property boundary, entrance to Olifantsnek area, traffic circle on entry road. 25° 47' 16.9" South; 27° 14' 30.1" East Location 3: Property boundary, along Third Avenue close to intersection with Fouche Street. 25° 47' 21.5" South; 27° 14' 30.5" East Location 4: Property boundary, entrance staff accommodation (current & future entrance). 25° 47' 26.5" South; 27° 14' 29.7" East Refer to Figures 8-1 – 8-3.
Interested and Affected Parties (I&APs):	82 I&APs registered including: <ul style="list-style-type: none"> • 36 neighbours – comments received from 14 • OCHOA (community) – comments received from 18 individuals as well as from MacRobert Attorneys • RLM (9 people) – comments received • Ward councillor • BPDM • NW DEDECT (5 people) – comments received • DAFF (2 people) • DEFF (2 people) • Department of Education (2 people) • Department of Water and Sanitation (eWULaas on-line system; meeting) • SAHRA (national & province & SAHRIS) - comments received • MBR NPC – comments received Refer to Table 8-1.
Comments received:	Yes.
Comments relate to:	Refer to Table 8-2.

8.2 Introduction

The Public Participation Process (PPP) aims to provide all Interested and Affected Parties (I&APs) with clear, accurate and comprehensible information about the project for the proposed development of a school on Portion 62 of the farm Commissiesdrift 327JQ, Olifantsnek, Rustenburg Local Municipality, North West Province. In addition, the process seeks to provide I&APs with the opportunity to indicate their viewpoints on issues and concerns about the proposed project.

This process, therefore, enhances transparency and accountability in decision-making, as it allows all I&APs to suggest ways of avoiding, reducing or mitigating potential negative impacts, as well as enhance positive impacts of the proposed project. All inputs from the I&APs are considered in the planning process. Consequently, clear recording of all issues and concerns raised have been maintained in a comments and response register. This register has been updated when new issues or concerns were raised.

This section provides a methodical description of the PPP followed. It also contains a complete record of public notices, details of all registered I&APs and all communications to and from I&APs pertaining to the application.

8.3 Approach

The aim of the PPP is not only to adhere to the required legislation, but also to give as many stakeholders and I&APs as possible, an opportunity to be actively involved in this process.

The PPP has been carried out in accordance with Chapter 6 of the NEMA and in support of the EIA Regulations of 2014 as amended. Based on these Regulations, published in terms of Sections 39 to 44 of GNR 982 amended in GNR 326 of NEMA, the following steps were undertaken:

- Potential I&APs were identified through obtaining contact details from the existing school (Mr Paul Peens) and the Olifantsnek Concerned Home Owners Association (OCHOA – Mr John Fourie), conducting a visit to the area on 5 and 16 July 2019, conducting interviews (in person and telephonically), completing Windeed searches for the details of neighbouring properties and property owners (Figure 8-4), through notices placed on site (Figures 8-1 – 8-3) as well as through placing a notice in the local newspaper, the Rustenburg Herald;
- A stakeholder register was compiled in terms of Regulation 42 that includes national, provincial and local authorities, government departments, organisations as well as neighbours that may have an interest;
- I&APs were given more than two (2) months to register and raise concerns (5 July to 2 October 2019) which included 30 days to comment on the draft BAR from 2 September – 2 October 2019. A hard copy was made available at Rustenburg Public Library in Heystek Street, Rustenburg and on CD or on a dropbox link (electronic copy) upon request. Any concerns that have been raised by I&APs were acknowledged, noted and addressed (Table 8-2) by the EAP where possible; and
- A recorded summary of concerns raised by I&APs, as well as the responses from the EAP, will be kept throughout the entire process.

8.4 Public awareness

8.4.1 Site Notices

Four (4) notices (measuring 800 mm x 600 mm) were placed at the site on 9 July 2019 at locations where these would be most visible to the public concerned. The notices were placed at the following locations:

- Site Notice 1: On the property boundary fence at the entrance to the Olifantsnek area, facing the R24 (subsequently removed by someone). GPS point: 25° 47' 16.1" South; 27° 14' 28.2" East.
- Site Notice 2: On the property boundary fence at the entrance to the Olifantsnek area, at the traffic circle on the entry road (Third Avenue). GPS point: 25° 47' 16.9" South; 27° 14' 30.1" East.
- Site notice 3: On the property boundary fence along Third Avenue close to the intersection with Fouche Street. GPS point: 25° 47' 21.5" South; 27° 14' 30.5" East.
- Site notice 4: On the property boundary, gate providing access to staff accommodation (current & future entrance). GPS point: 25° 47' 26.5" South; 27° 14' 29.7" East

Each notice contained details regarding the applicant (REC Establishers (Pty) Ltd), the nature of the activity (School and associated sports fields), the locality (Portion 62 of the farm Commissiesdrift 327JQ, Olifantsnek, Rustenburg Local Municipality, North West Province), and the contact details of the EAP (See Figure 8-1). The placement of the site notices was recorded by taking photographs of the placed notices on site, as well as by recording the GPS coordinates of these positions. See Figures 8-2 – 8-3. These notices remained on the site for the duration of the process (July - October 2019), except the one which was removed by an unknown individual.

8.4.2 Newspaper Notice

A detailed newspaper notice was placed in the Rustenburg Herald Newspaper, published on 5 July 2019 (see Appendix F). Distribution areas of the newspaper are as follows:

- Waterkloof
- Rustenburg
- Boons
- Bleskop
- Brits
- Buffelspoort
- Derby
- Elandskraal
- Groot-Marico
- Hartbeespoort
- Karlienpark
- Kroondal
- Lichtenburg
- Marikana
- Moedwil
- Mooinooi
- Northam
- Rex
- RPM

- Sun City
- Swartklip
- Swartruggens
- Thabazimbi
- Tlhabane
- Waterfall Mall
- Zinniaville
- Zeerust

The aim of placing a notice in the local newspaper was to create a greater awareness of the project and to invite a broader spectrum of I&APs to register and be part of the process.

32 000 copies of the newspaper are distributed weekly.

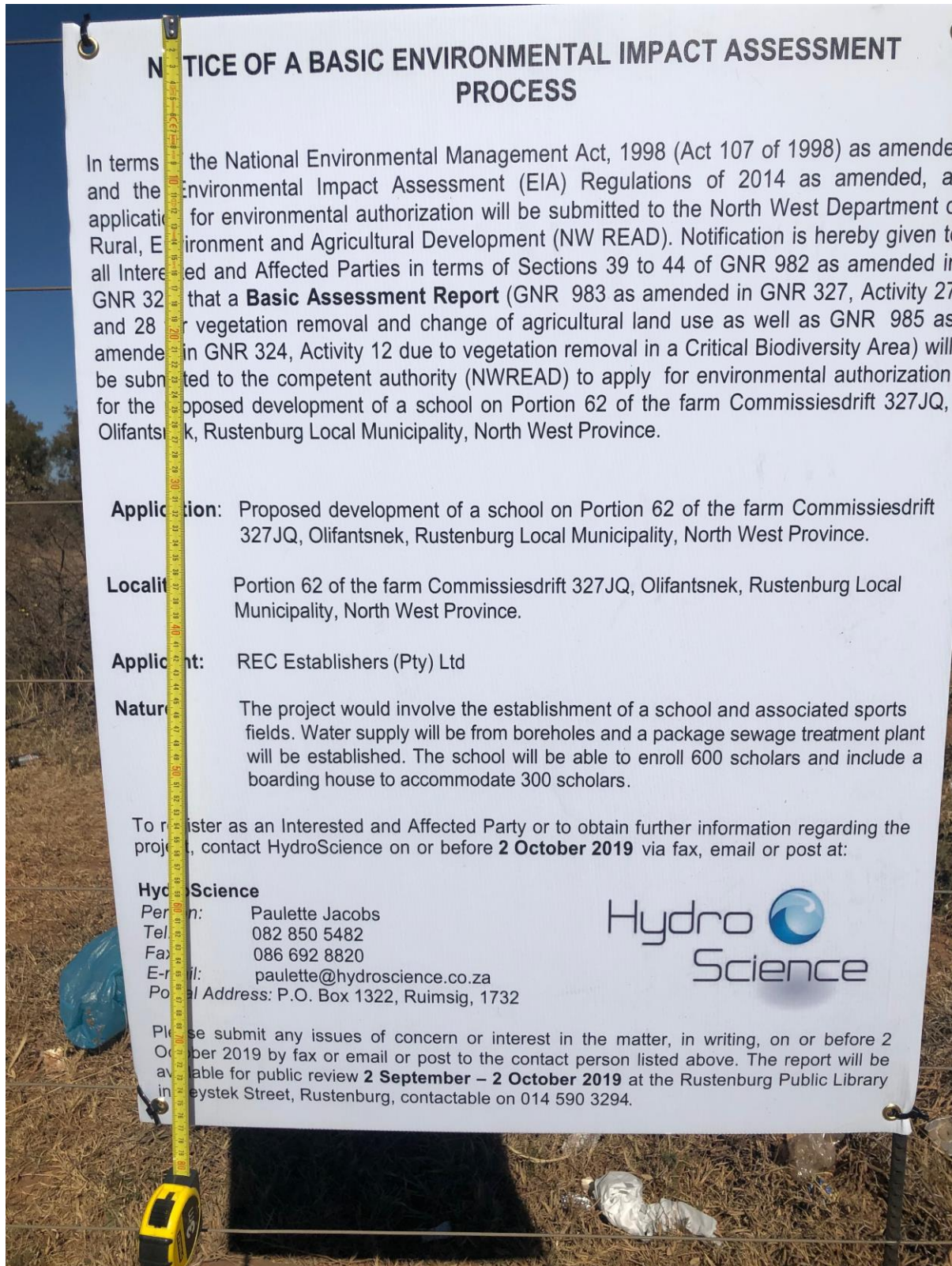


Figure 8-1: Wording and size of notices placed



A: Proof of notice 1: Property boundary, entrance to Olifantsnek area, facing R24.
GPS point: 25° 47' 16.1" South; 27° 14' 28.2" East
(subsequently removed)



B: Proof of notice 2: Property boundary, entrance to Olifantsnek area, traffic circle on entry road (Third Avenue).
GPS point: 25° 47' 16.9" South; 27° 14' 30.1" East



C: Proof of notice 3: Property boundary, along Third Avenue close to intersection with Fouche Street.
GPS point: 25° 47' 21.5" South; 27° 14' 30.5" East



D: Proof of notice 4: Property boundary, entrance staff accommodation.
GPS point: 25° 47' 26.5" South; 27° 14' 29.7" East

Figure 8-2: Photographs and GPS coordinates of notices placed on site

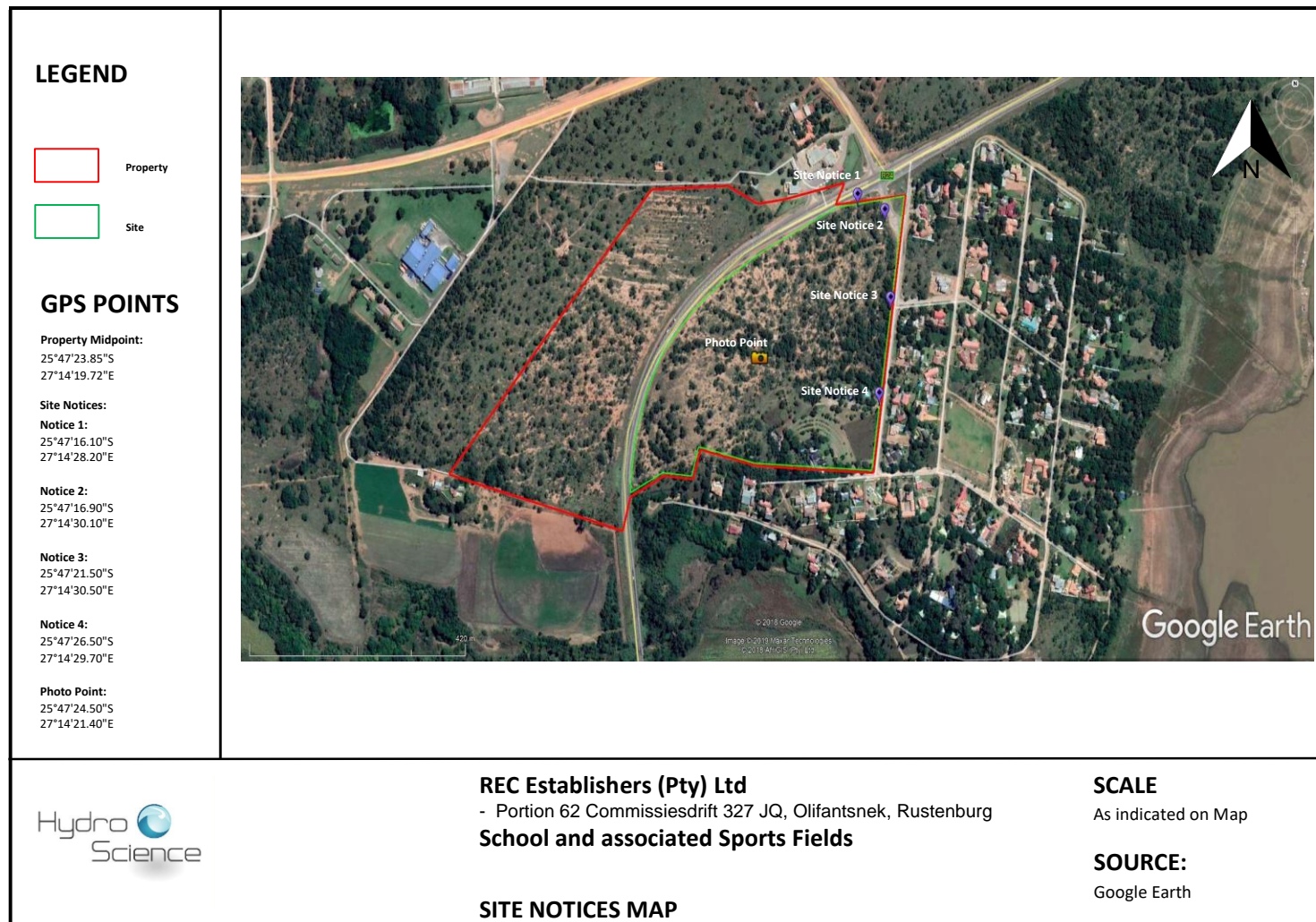


Figure 8-3: Aerial view of location of site notices

8.5 Comments and Response Register

Any concerns that were raised by I&APs during the process were recorded and addressed by the EAP where possible (see Table 8-2). All proof of communication can be seen in Appendix F.

Furthermore, all registered I&APs were given an opportunity to comment in writing (2 September – 2 October 2019), on the draft BAR before its submission to the competent authority, NW DEDECT in October 2019.

8.6 BAR Submission

The draft BAR (this document) has been made available for public review at the Rustenburg Public Library (hard copy) and electronically (CD / dropbox) from 2 September – 15 October 2019. All I&APs have therefore been given an opportunity to comment on this document for a period of 30 days. Once the period for comments lapsed, the document was collected, and all comments made were included in the comments and response register.

After submission of the draft BAR to the authorities, during the public review period, the authorities listed below, were also afforded an opportunity to submit their comments to be addressed in the final BAR.

Thereafter, the final BAR (including all supporting documentation) will be submitted to NW DEDECT for consideration. A decision will be provided by NW DEDECT in terms of their considerations and findings and if authorised, conditions of the authorisation will be provided.

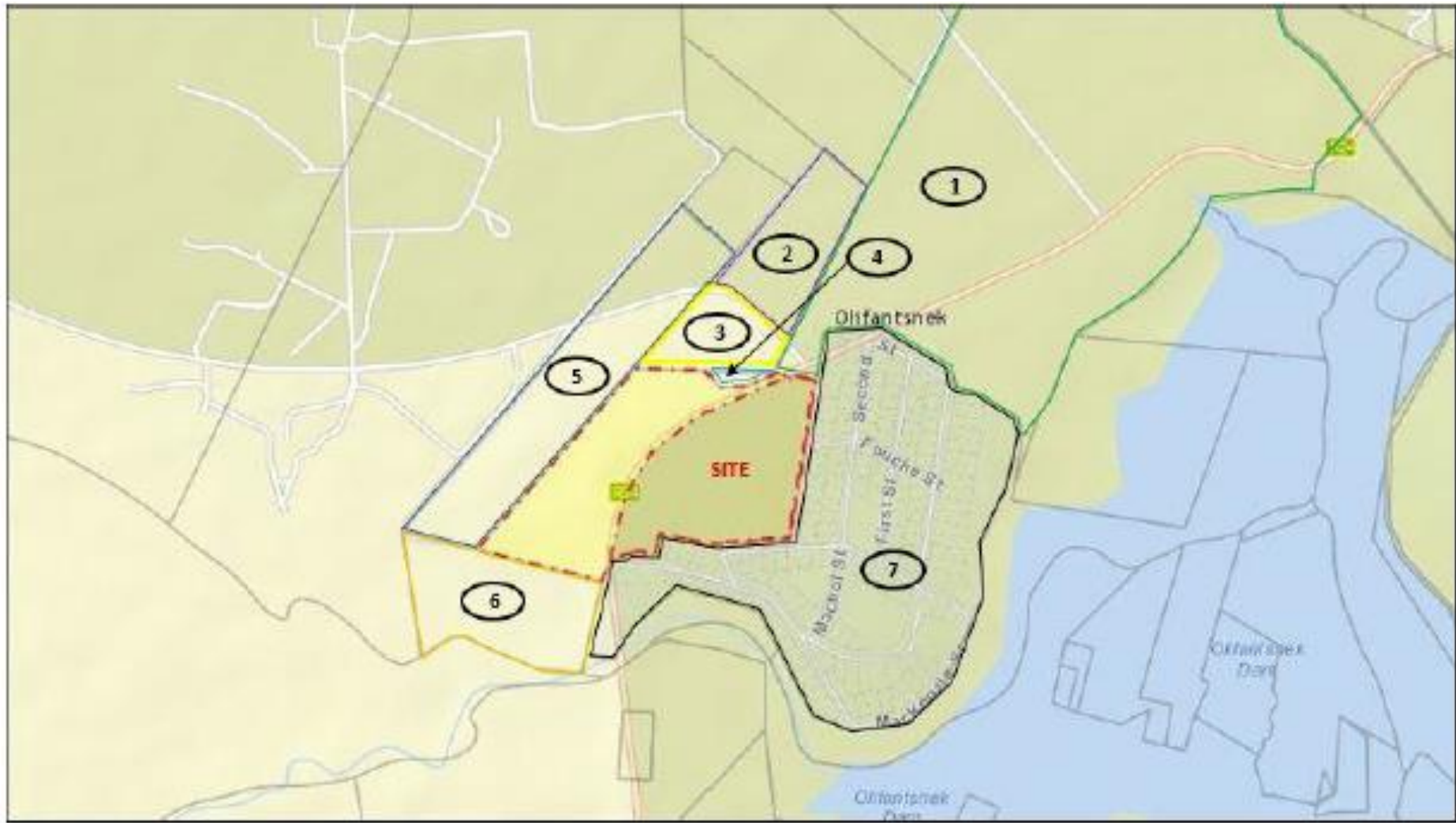


Figure 8-4: Surrounding properties

Table 8-2: Register of I&APs

Neighbouring landowners, residents and businesses			
Map I.D.	Property:	Owner:	Interaction:
1	Portion 42 of the farm Commissiesdrift 327JQ (north east of site)	VH & HG Lange	Email: 2019-07-12
2, 3 & 4	Portions 72 & 77 of the farm Commissiesdrift 327JQ (north of site)	A Pretorius	Email: 2019-07-12 Visited by geohydrologist Comments received: 2019-10-07
5	Portion 45 of the farm Commissiesdrift 327JQ (west of site)	RLM	Email: 2019-07-12
6	Portion 56 of the farm Commissiesdrift 327JQ (south west & south of site)	Polyurathane Sales and Services CC (Morne & Clinton Graham)	Email: 2019-07-12 Draft BAR: 2019-09-27 (courier OLW 7263732) Comments received: 2019-09-24; 2019-10-02
7	Olifantsnek residential area (east of site) – also see below	OCHOA (John Fourie; Pieter Minnaar)	Email: 2019-07-12 Email: 2019-07-15 Registered: 2019-07-15 Draft BAR: 2019-09-02 Comments received from attorney: 2019-10-01
	Rainbow Chicken Farms Re availability of water from their Rand Water pipeline to reduce pressure on groundwater resource as only water supply source	Elvin Johnson Anton van der Nest	Visited by geohydrologist. Telephone communication: on-going Email: 2019-09-20 Conclusion: 2019-10-14

Erf	Owner:	Interaction:
THIRD AVENUE		
3	Ronnie Kuhn	Hand-delivered: 2019-07-09; Email: 2019-07-12
4	Salome / Obed Kompecha	Email: 2019-07-15 Comments received: 2019-08-01; 2019-09-23; 2019-09-30; 2019-10-08
5	Aveling Francina / Ernie Williams / Zanelle Williams	Hand-delivered: 2019-07-16; Email: 2019-07-17
6	Mabale Nathaniel	Email: 2019-07-22

Erf	Owner:	Interaction:
7 & 8	RLM	Email: 2019-07-12
9	Gert Eastes	Hand-delivered: 2019-07-09
10	Mr Paramanathen Govender	Hand-delivered: 2019-07-09
11	Andre Louw	Email: 2019-07-12
12	De Jager	Hand-delivered: 2019-07-09; Email: 2019-07-12
13	Andries Pieterse	Email: 2019-07-22
14	Rudolf Viljoen	Email: 2019-07-12
15	Tebogo Molefe	Email: 2019-07-12 Comments received: 2019-09-17
16	Adriaan Roux	Email: 2019-07-15; Hand-delivered: 2019-07-16
STUBB STR		
128	Hendrik Mienie	Email: 2019-07-12; Registered: 2019-07-15; Visited by geohydrologist: 2019-07-20 Comments received: 2019-07-15
127	Phillip Mwase	Email: 2019-07-22 Registered: 2019-10-10
126	Ivan Spencer Claasens	Hand-delivered: 2019-07-09; Email: 2019-07-12
125	Mary Masango	Hand-delivered: 2019-07-09
124	Christiaan Pieterse	Email: 2019-07-12
123	Oliver Page	Email: 2019-07-12 Visited by geohydrologist Comments received: 2019-09-03
122	Kobus Vorster	Email came back undelivered. Phoned three (3) times and left messages. Comments received: 2019-09-30
121 & 120	Hendrik Pieterse	Hand-delivered: 2019-07-09 Comments received: 2019-09-30
MAIN STR		
119	Johan Engelbrecht	Email: 2019-07-12 Visited by geohydrologist
118	Dirk Hurn	Email: 2019-07-12 Visited by geohydrologist
117	Peter Mataboge	Email: 2019-07-22 Response: 2019-07-23 No objection as long as his stand is not reduced
116	Jo Mathloko	Email: 2019-07-15
115	Maleke Gloria Lekalakala	Email: 2019-07-22
OTHERS (OCHOA)		
	Mr & Mrs van der Merwe	Comments received: 2019-07-29; 2019-10-01
	Andrew Ross Dinnes	Comments received: 2019-08-28; 2019-09-18
	Linda Gloy	Comments received: 2019-09-25
	Gerrie Naude	Comments received: 2019-09-30
	WM Coetzee	Comments received: 2019-09-30
	Duan van Wyk	Comments received: 2019-09-30

Erf	Owner:	Interaction:
	Gucci	Comments received: 2019-10-01
	Antoinette Keyser (Hodge Podge Lodge Backpackers)	Comments received: 2019-10-01
	Marina Kuhn	Comments received: 2019-10-01
	Peter Minnaar	Comments received: 2019-10-01
	Ronald & Mariza Gorrie	Comments received: 2019-10-01
	Jaco Malan	Comments received: 2019-10-01
	Tony Kleyn	Comments received: 2019-10-02
	DEH (Ekkehard) Pape	Comments received: 2019-10-09; 2019-10-15
	Jan Ntemane	Comments received: 2019-10-10
	John Barton	Comments received: 2019-10-02
	MacRobert Attorneys on behalf of OCHOA	Comments received: 2019-10-02

Authorities and other stakeholders:		
Authority / organisation / entity:	Section / Department:	Interaction:
Local authority: RLM	Integrated Environmental Management (Lilian Sefike; Kelebogile Mekgoe)	Email: 2019-07-12 Draft BAR: 2019-09-02 Site visit: 2019-09-17 Comments received: 2019-11-04
	Town Planning (Thato Molwantwa)	Email: 2019-07-12
	Water and Sanitation (Ziyanda Mateta; Thembi Ntabanyane)	Email: 2019-07-12
	Waste (Julian Nkoana)	Email: 2019-07-12
	Roads and Transport (Fumani Ntlhamu; Godfrey Mahlangu; Masego Moatshe)	Email: 2019-07-12
	Office of the speaker: Ward 36 Councillor (Cllr Pogiso Tsienyane)	Email: 2019-08-19
District authority: BPDM	Environmental (Joshua Moss)	Email: 2019-07-12
Provincial authority: NW READ	Head office (Portia Krisjan, Ellis Thebe, Ouma Skosana) Rustenburg office (Motshabi Mohlalisi, Queen Imasiku)	Email: 2019-07-12 Application accepted: 2019-07-29 Reference: NWP/EIA/26/2019 Draft BAR: 2019-09-02

Authorities and other stakeholders:		
Authority / organisation / entity:	Section / Department:	Interaction:
		Site visit: 2019-09-17 Comments received: 2019-09-27
National authority: DEA	(Albi Modise; Kallie Naudé for Biosphere)	Email: 2019-05-10 Email: 2019-09-04
Department of Education	Rustenburg (MR Mathe) Mahikeng (Patience Pule)	Email: 2019-08-28
DWS	eWULAas Thato Mjona (Pretoria) Mashudu MMbadi (Hartbeespoort)	Reference: CT11664 Pre-application meeting: 2019-10-31
SAHRA	National (Natasha Higgitt) Provincial (Mosiane Mathlabane)	Email: 2019-07-12 Draft BAR on SAHRIS: 2019-08-27 Comments received: 2019-09-27
Department of Agriculture, Forestry & Fisheries (DAFF)	Province (Lufuno Nevhuvumba) National (Thoko)	Email: 2019-07-12
Magaliesberg Biosphere Reserve (MBR) NPC (due to location in buffer)	Belinda Cooper	Email: 2019-07-12 Registered: 2019-07-15 Draft BAR: 2019-09-03 (courier OLW 7169378) Comments received: 2019-10-01

Table 8-3: Comments and responses

Organisation / company / person:	Date:	Comment:	Response:
JH Mienie (Stubb St)	2019-07-15	Water availability	Geohydrological investigation. Geohydrologist visited Mr Mienie. No impact expected on Mr Mienie's borehole.
Obed Kompecha (Third Ave)	2019-08-01 (Whatsapp)	Clarification required re commenting period. Meeting?	Question / queries / concerns / comments welcome. Report available from 2 September 2019. Review report and if you require someone to meet with you we will arrange.
D.E.H. Pape (Steinfurt Boerderye)	2019-07-16	Register.	Registered.
WM (Willem) & DM (Danielle) van der Merwe	2019-07-29	Registered. Issues: <ul style="list-style-type: none"> • Concerned – only BA process. • Groundwater (impact on other groundwater users and devaluation of properties if water availability is impacted). • Security – community health and safety. • Proximity to filling station. • Noise – local community & biodiversity. • Traffic. • STP – sanitation, health, ecosystem effects. • Air quality. • Climate – global warming • Geomorphology and landscape – 	Registered. <ul style="list-style-type: none"> • Explained reason for BA process, not inferior process. • Refer to geohydrology study (Appendix E). • Refer to specialist reports and BAR for details (available 2 September 2019) and briefly responded per email (attached in Appendix F).

		<p>use of non-renewable resources, waste disposal etc.</p> <ul style="list-style-type: none"> • Surface water quality – sustainability, health • Terrestrial ecology & biodiversity. • Socio-economic – community welfare. 	
Andrew Ross Dinnes	2019-08-28	<ul style="list-style-type: none"> • Water: weak; depletion of reserves; impact on community; fatal flaw for school project; Rand Water pipeline • Sewage: agree with STP; water requirements; location (smell); impact of spillages • Traffic: increase a problem; dedicated traffic circle; eliminate safety risk; prevent frustration. • Environment: eco-friendly; impact of people 	<ul style="list-style-type: none"> • Water: Category C full geohydrological study – refer to Appendix E. • Sewage: STP only require influent no additional water; Layout (Appendix D shows position); design & technology (Appendix G); EMPr addresses spillages. • Traffic: Buses & deliveries will use entrance along circle (see Appendix D). Traffic Impact Assessment to be initiated. • Environment: CBA2, ESA1, IBA and MBR buffer. Biodiversity study (Appendix E) to investigate impact. <p>Will obtain copy of report from John Fourie.</p>
Rainbow Farms (Elvin Johnson) (Anton van der Nest)	2019-09-03 Email: 2019-09-20		Rand Water pipeline and water availability from this source.

Comments on the Draft BAR				
Tebogo Molefe (Third Ave)	2019-09-17	Requested further information. Strong believe that it is a good thing. No objection. Support fully.	Referred to library (hard copy) or obtain electronic copy from OCHOA (John Fourie).	
Oliver Page (Stubb St)	2019-09-03 2019-10-01	Request confirmation of registration as I&AP. In favour of schools but some serious concerns. 1. Water supply: Scarce after 5 years of poor rainfall, residents struggle to get adequate water from boreholes. Question results of borehole testing due to long period after pumping. Results in report indicated barely enough if carefully managed. Size of school with boarding require significant water. Another water source necessary to not place community in jeopardy. 2. Traffic: No plans – concern with management of traffic. Dangerous entrance and traffic volume brought by school will exacerbate. One access road into village – safety and effective management to not impact residents unduly. School children walking on roads but not traffic conscious.	Confirmed registration. 1. Water supply: Water availability was identified as an environmental concern from start of project. Specialist geohydrological investigation. Hydrocensus to get water levels (water depth), other water users, purposed for water use and water quantities, borehole yields and sustainability. Procedure for pump testing give results which can scientifically be interpreted - no impact on results. Water use will have to be carefully managed – also applying for a WUL from DWS. Fully occupied (long term), school will require 56.1m ³ water / day. Also discussing with Rainbow Farms to obtain water from their Rand Water pipeline to reduce pressure on groundwater. 2. Traffic: Traffic study undertaken – will provide feedback.	

		<p>3. STP: Use of water. Affect groundwater. Cause air pollution. Management required.</p> <p>4. Lifestyle: Natural environment. Peace and quiet. Negative impact by school.</p>	<p>3. Sewage: A package STP should not affect groundwater – enclosed, contained system.</p> <p>4. Lifestyle: Impacts on ecosystems addressed in report and biodiversity study (Appendix E0).</p>
Andrew Ross Dinnes	2019-09-18	<p>Placement of STP just above community borehole a concern. Spillage / seepage will directly affect community water supply source, river and dam. Suggest location on opposite side of R24.</p> <p>Community borehole level not measured. Water shortage, baseline. Suggested use of Rand Water Board.</p> <p>Traffic study to be conducted. Congestion and accidents with current design. Main entrance on R24 to be changed to a circle with school having its own entrance from the circle.</p>	<p><u>Pollution risk:</u> No seepage due to design (contained, closed system). Possible spillages addressed in EMPr. Refer to groundwater contamination risk (sand and silt have medium to high capacity to create an effective barrier to the movement of biological contaminants and negligible risk of organic or microbiological contaminants). Risk to water resource from French drains used by community is much higher than STP opted for.</p> <p><u>Location:</u> Sewage has to flow by gravitation (topographical considerations). Effluent from STP to be used for irrigation of sport fields – not practical to transport sewage to the other side of the R24 for treatment and then back again for use.</p> <p>Geohydrologist was unable to gain access (legally & practically) – Pieter Minnaar & John Fourie were contacted on numerous occasions. Rand Water pipeline belongs to Rainbow Farms. Communication with Rainbow Farms to determine availability.</p> <p>Traffic impact study has been initiated and will revert back with results.</p>

		<p>2. Layout.</p> <p>3. Three boreholes – next door – new ground and our boundary?</p> <p>4. Smell from STP</p> <p>5. What on ground next to us?</p> <p>6. Our boreholes ±100m from boundary fence.</p> <p>7. Our boreholes for irrigation and household. Table has dropped.</p>	<p>2. Appendix D of CD. Attach again. Some changes to allow for more parking and space on site to move to minimise traffic on Third Avenue.</p> <p>3. Portion 62 on other side of R24. Close to your property boundary. Figure 10-1 page 96 shows all borehole locations.</p> <p>4. Package STP should not be smelly – enclosed / contained system with no aeration ponds.</p> <p>5. This project only for portion of property on Olifantsnek village side of R24.</p> <p>6. Correct.</p> <p>7. Noted, your borehole considered in geohydrological investigation.</p>
NW DEDECT (Queen Imasiku)	2019-09-27	Indicate conclusion date of development to determine validity period of EA.	5 – 10 years validity required.
Gerrie Naude (Olifantsnek home owner)	2019-09-30	<p>1. Groundwater table insufficient to accommodate more people to use groundwater. Struggling as community due to inadequate quantities.</p> <p>2. Only basic assessment – not sufficient – full assessment in Olifantsnek.</p>	<p>1. Geohydrological investigation to address groundwater issue. Please review.</p> <p>2. Basic assessment not inferior process. Number of specialist studies, impact assessment and management programme.</p>

		<p>After mitigation, development can proceed.</p> <p>Subterranean presence of archaeological and/or historical sites, features or artifacts is always possible. Some sites may only become known later on due to vegetation density. Operating controls and monitoring to be aimed at possible unearthing of features. If discovered, archaeologist to investigate. Also inform SAHRA APM unit. If significant, phase 2 rescue operation may be required subject to SAHRA permit.</p> <p>Inform SAHRA burial grounds and graves if unmarked human burials are uncovered.</p> <p>No objection.</p> <p>Support specialist recommendations and require adherence to these.</p> <p>Submit final BAR and EMPr to SAHRA.</p> <p>Upload NEMA decision onto SAHRIS.</p>	<p>Noted.</p> <p>Refer to EMPr.</p> <p>Noted. Included in EMPr.</p> <p>Noted.</p> <p>Noted.</p> <p>Will do.</p> <p>Will do.</p>
WM Coetzee (92 Main St)	2019-09-30	<p>Repudiate and sanction development.</p> <p>Noise disturbance of epidemic proportions.</p>	<p>Noted.</p> <p>As per EMPr.</p>

	<p>2019-10-01</p>	<p>Scholars moving around pestering pets and damaging property.</p> <p>Replaced light on front wall on numerous occasions due to it being thrown out with stones. Damage to property.</p> <p><u>Water scarcity:</u> water requirements for 300 kids and huge irrigation system.</p> <p><u>Traffic:</u> Entrance cannot accommodate traffic. Associated dangers.</p> <p>Impact of increased traffic on lives and movement of children in the community.</p> <p>Way forward – many emails indicating no advantage to community.</p> <p>Supply Water and Sanitation, North West Parks Board – Magaliesberg Biosphere. Do they have WUL?</p> <p>Big legal battles.</p> <p>Same email to justify impact study – humanitarian disaster.</p>	<p>Discuss scholar conduct with school. Also informed school.</p> <p>Property damage is unacceptable. If not resolved with school, report to police.</p> <p>Refer to geohydrological investigation re water requirement and supply. Treated wastewater will be used for irrigation (not groundwater).</p> <p>Traffic study underway. Forward traffic study.</p> <p>All comments, concerns & objections are captured and presented to decision-making authority for consideration. All available studies and information has been available since 2 September as per my email and John Fourie's whatsapp.</p> <p>In Magaliesberg Biosphere buffer zone as per report. Magaliesberg Biosphere Management Board also has copies of documents for comment. As per Appendix G, the WUL application process has been initiated.</p> <p>Noted.</p> <p>Same response for same questions.</p>
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<p>Kobus Vorster (122 Stubb St)</p>	<p>2019-09-30</p>	<p>Why only basic assessment?</p> <p><u>Groundwater:</u> Not enough groundwater.</p> <p>Previous development stopped because of no water and sewage plant not good.</p> <p><u>Sewage:</u> Existing school, sewage management not good and out of property boundary. STP VERY CLOSE to community borehole pump.</p>	<p>Listed activities as per legislation (p25 of report) only require Basic Assessment.</p> <p>Refer to geohydrological investigation – Appendix E.</p> <p>Apparently this was stopped due to insufficient stands sold.</p> <p>STP on project site. Yes close to community borehole – selected due to minimal risk to groundwater (septic tanks and French drains used in community)</p>
<p>Duan van Wyk</p>	<p>2019-09-30</p>	<p>Basic assessment will not suffice.</p> <p><u>Water:</u> Groundwater use by everybody. Cannot sustain another 600 people. In depth test required.</p> <p><u>STP:</u> Will not be able to handle so many people. Result in water and environmental pollution.</p> <p><u>Lifestyle & traffic:</u> Quiet and peaceful environment. 600 extra people will bring end to nice tranquil environment. Effect on traffic.</p> <p>Not proper impact study done – effect Olifantsnek residents negatively.</p>	<p>Process followed is determined by the activities triggered in terms of legislation. Not an inferior process.</p> <p><u>Water:</u> Refer to geohydrological study in Appendix E.</p> <p><u>STP:</u> STP is new and therefore designed to a capacity required to prevent water and environmental pollution.</p> <p><u>Traffic:</u> Traffic impact study undertaken.</p> <p>Proper impact study done with large number of specialist investigations. Has the report been reviewed?</p>

	2019-10-01	As with traffic impact study undertaken. Basic assessment cannot suffice as it clearly did not cater for all scenarios.	Still basic assessment. Traffic information incorporated as groundwater information was incorporated.
Henk Pieterse (120 & 121 Stubb St) (Laerskool Proteapark)	2019-09-30	Moved here for safe and quiet neighbourhood. No Olifantsnek scholars in school. Only for profit, not for community needs. Owners do not take hands with community. <u>Water:</u> Dried up boreholes etc. Protect water. Water quantities provided for scholars and soccer field. School will use all groundwater. Get municipal water. <u>Sewage:</u> Smell. Capacity for requirements. Impact negatively on community, residents and groundwater.	Intention to stop the development of the school is noted. Schools have an educational purpose and do address a social need though it might not be for the direct community but for the community at large. <u>Water:</u> Realised from the start and therefore a geohydrological specialist investigation was commissioned. P38 water requirements calculated – adequate allowance. Borehole water not used for the soccer / sports fields (p 28 & 51) - irrigated with treated wastewater. Communication with Rainbow Farms to see if they can give the school an allocation from their Rand Water pipeline. <u>Sewage:</u> Closed and contained without aeration ponds and therefore there should not be a smell.
Gucci	2019-10-01	Prefer for municipality to install sewer system prior to school development. Digging for sewage and taking groundwater from same place – bad ecological system. Not at this stage.	RLM no plans to install sewer. School plans to do own treatment system. Specific reason why school will not make use of septic tanks and French drains (digging) as done by the community. Install proper STP.

<p>Antoinette Keyser (Hodge Podge Lodge Backpackers)</p>	<p>2019-10-01</p>	<p>Complain:</p> <ol style="list-style-type: none"> 1. How will sewage be kept from polluting dam (agricultural use) and boreholes. Dry boreholes and dam due to drought etc. Where will STP be placed to allow sufficient capacity. Where will water come from. People buying water. 2. Where will 60m³/day water for school come from. No capacity in community borehole. Borehole under bridge will be broken down due to SANRAL building highway there. 3. Traffic – entrance does not have adequate capacity for additional; people / traffic. 4. Security – REC not interested in being part of community watch, which was established because of high crime rate. 5. Road standard inadequate for large traffic volumes. Residents do road maintenance at own cost as RLM does not. REC does not contribute to community funds or activities but use what they can to their own benefit. 6. No fire fighting equipment. Where will water for fire fighting come from? Land claim by Bafokeng. 	<ol style="list-style-type: none"> 1. Sewage treated in enclosed, contained package STP to prevent pollution to groundwater (boreholes) and surface water (dam,). Appendix D (layout plan) shows position of STP. STP designed to handled expected sewage quantities. 2. Water from boreholes on property on other side of R24. Geohydrological studie determine water requirements, availability and use in area (considering other water users as well). Rainbow Farms water pipeline also investigated as potential additional source to reduce pressure on boreholes. 3. Traffic study underway. 4. Landowners cannot be forced to become part of security watch. 5. Issues with RLM cannot be addressed. REC provided a list of their involvement and contributions to the community. 6. See EMPR page 92 onwards – fire fighting requirements.
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<p>Marina Kuhn (142 Machol St)</p>	<p>2019-10-01</p>	<p>Shortage of water and water pollution.</p> <p>Contamination of soil and pollution.</p> <p>Danger with traffic.</p> <p>Sewerage.</p> <p>Place of rest. Noise pollution.</p>	<p>Water requirements, availability and use as well as pollution potential addressed in report and geohydrological investigation.</p> <p>Addressed in EMPr.</p> <p>Traffic impact study underway.</p> <p>Addressed in report.</p> <p>Comply with municipal bylaws.</p>
<p>WM (Willem) & DM (Danielle) van der Merwe</p>	<p>2019-10-01</p>	<p>Concerns remain the same after reading documents.</p> <p><u>Groundwater:</u> Impact will impact property values (damages). No proper groundwater tests for restoration potential, which will not be good.</p> <p><u>Traffic:</u> Increase significantly. Impact on roads which residents maintain at own cost.</p> <p>Noise, dust, light & various other pollutions remain unanswered.</p> <p>Reiterate previous correspondence (15 August 2019). Basic assessment will not suffice.</p>	<p><u>Groundwater:</u> Geohydrological investigation will be evaluated by authorities (DWS) to prevent water use from impacting other water users as stipulated in law. Test were done in accordance with DWS requirements. Please provide your borehole recovery test results if they contradict ours.</p> <p><u>Traffic:</u> Traffic impact study being done.</p> <p>Addressed in EMPr. Added to light</p> <p>Regulations stipulate Basic Assessment.</p>

<p>John Fourie</p>	<p>2019-10-02</p>	<p>Not all residents seen as concerned and affected parties but are. Report does not consider the neighbourhood of Olifantsnek as a whole.</p> <p>Hope that all comments submitted will be included. No against development in community as long as it is to the benefit of the whole community and not just a select few or detriment of Olifantsnek neighbourhood.</p> <p>Appreciate traffic study initiated. Will there be opportunity to look at it.</p> <ul style="list-style-type: none"> • Basic impact study. Why not more detailed as development affects whole community? • Motivation from REC: Focus on need from all over SA and neighbouring countries. Translate into approving the community – not improved education for Olifantsnek residents. • Reliance on groundwater: REC want to gamble with water availability in the hope infrastructure will happen. Strain to limited supply. Study only considered selected erven and not Olifantsnek as a whole. More detailed study required. 	<p>Legally required to notify properties bordering proposed school. Relied on OCHOA representing the Olifantsnek community to ensure involvement of larger community as we realised they might be concerned parties.</p> <p>Assurance that all comments will be included – summary in report but original comments and responses in Appendix F.</p> <p>Yes.</p> <ul style="list-style-type: none"> • Determined by listed activities triggered – refer P25. • Look at local community (Olifantsnek) as well as larger community (South Africa) • Water supply: Not aware of any projects by RLM to improve infrastructure in the area in the near future. Alternatives are being considered – Rainbow Farms pipeline to reduce pressure on groundwater. Geohydrologist attempted 20 times to get hold of Pieter Minnaar to get access to Olifantsnek community borehole.
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		<ul style="list-style-type: none"> • Waste: Letter from resident indicating service provided. Burning of garden refuse & rubbish on current property. Why does community have to allow development and police it? • Sewage: Long term effect of grey water? Contingency for system fail/break/leak and effects on dam & groundwater. • Appendix D: Layout: Only one? Huge spotlights (light pollution to community). Pavilion is facing Olifantsnek neighbourhood – noise pollution in quiet surrounds (echo bouncing off mountains). Loud noise, fireworks, music, gunshots etc. Noise study required for impact from sporting events. Who will monitor noise based on guidelines in document – community cannot police. • Location of STP: Close and above community borehole – fail safes? 	<ul style="list-style-type: none"> • Burning of waste prohibited in EMPr – legally enforceable if development is approved. Lodge complaint with NW DEDECT compliance & enforcement to investigate. Offered assistance with reporting. • In school’s interest to ensure optimal operation of STP due to use of effluent for irrigation on sports fields (compliance of water quality with planned use – environmental & human health). No impact on groundwater & Olifantsnek dam expected with operation according to design. . Management measures are included in EMPR (section 10) to deal with spillages. • Attached another layout – preferred since it allows for more parking and moving space on site to limit traffic impacts in Third Avenue. . Spotlights for evening sport events – face down and in towards sports field. Fireworks illegal – no fireworks allowed on school grounds due to close proximity to community, people, children & animals. Noise study to be brought to attention of school. • Not a concern as no discharges or seepage which can impact community borehole. Captured, contained, treated and reused.
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		<ul style="list-style-type: none"> • P18: Spatial development – Residential but service provision remains a problem. What changed? • P24: Sustainable development – no mention if underground water is sufficient and sustainable. Will there be enough water in the long term if there is no infrastructure in Olifantsnek? • P28/39: Hydrocensus did not look at all boreholes – more thorough water study required to assess impact on all residents underground water. REC withdrawing water before community will directly impact community. • P76: Operational phase groundwater extraction. Only one potential user affected. Will Mr Graham need to reduce his farming activities to allow school? P102 condition of approval to communicate with each other? Not considered effect on ±80 or more boreholes in Olifantsnek community. 	<ul style="list-style-type: none"> • From RLM documents. Not adequate stands sold to move forward with residential development. Yes service provision remains a problem. • Water addressed in document, further on – geohydrological investigation confirmed adequate water. Communication with Rainbow Farms to obtain water from their Rand Water pipeline. • Only boreholes in the same catchment were considered. Other boreholes will not be affected due to watershed. Not all boreholes get water from the same aquifer. • Graham's will not be required to reduce farming activities for the sake of the school. One water users not allowed to negatively impact another water user's rights. Section 10 is EMPr and will become legal requirement.
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		<ul style="list-style-type: none"> • P100: groundwater quantity / availability. No mention that it will not affect community of Olifantsnek. More detailed study required. <p>More detailed study on community since a lot more people will be affected than indicated in the study.</p> <p>Will project be to benefit of the community as a whole?</p>	<ul style="list-style-type: none"> • Geohydrologist visited community borehole but could not gain access to test. Tried to get hold of Mr Minnaar 20 times. Borehole is over pumped – pumping at maximum capacity for long hours – damage to borehole – pumping air. <p>Education is always a benefit to a community at large.</p>
Peter Minnaar	2019-10-01	<p>Register. Against development – insist fully fledged EIA rather than Basic Assessment.</p> <p>Specialist studies to address:</p> <ul style="list-style-type: none"> • Water supply - proper testing of water quality, borehole yield and recovery time. Water License. • Traffic – include learners walking in entrance road and standing next to R24 and at Olifantsnek entrance waiting for taxis. • Noise impact study – normal school hours, after hours, weekends & events. 	<p>Registered. Noted. Legislation stipulates Basic Assessment,</p> <p>Specialist studies were conducted.</p> <ul style="list-style-type: none"> • Done as part of geohydrological study based on DWS requirements. Water Use License will be lodged – process commenced (see Appendix G). • Traffic impact study underway. Generally does not assess pedestrians. • Not planned – generally not for developed areas.

	<ul style="list-style-type: none"> • Waste management – control littering at Olifantsnek entrance, 3rd avenue and next to R24 where learners wait for taxis. • Sewage plant – location and operation including emissions and waste / byproduct. Detailed spill response and management plan. • Light pollution – light emissions from school, boarding house & sports field. • Socio economic study • Public participation meetings with all affected parties. • Property values – increase in insurance due to close proximity to school. • Zoning – can school be built on current zoning. <p>School's contribution to community. No assistance with road maintenance or donations to upgrade infrastructure & security.</p>	<ul style="list-style-type: none"> • EMPr – Section 10. Littering not acceptable. • Location based on gravitational flow to minimise spillages which will occur if pumped under pressure. Effluent reused. Sludge removed off-site for disposal (Appendix G). Spill response and management addressed in EMPr. • No study planned but bring to attention of school. • Large number of comments and input from community. Same points will be raised during social study. • Provide suitable date for meeting. Geohydrologist tried 20 times to meet with you re community borehole. • Unaware of increased risk for increased premiums due to proximity to school. • No it cannot. Rezoning in terms of SPLUMA by town planner – Nolte Ekkerd. <p>School, since 2005 in Olifantsnek, contributes to education. Sports field established on Erf 45 in 2015 at R2 million and maintained for residents to use free of charge. Legal expenses due to opposition. Employment (67 people) of who 24 live in Olifantsnek. 24 households benefit from services rendered to school.</p>
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			<p>Provided water when community borehole could not. Tarred Machol Street (Stubb St to school entrance) and maintain. 2 full time security to patrol area at & around school. Maintain entrance to Olifantsnek and collect litter. Pays RLM considerable rates and taxes. State of the art education facilities, employment opportunities and maintenance of surrounding infrastructure.</p>
Ronald & Mariza Gorrie	2019-10-01	<p>Geohydrology comments:</p> <ul style="list-style-type: none"> • No indication or reference to community to north east of development and impact of development on their boreholes. Property values directly linked to water availability. Reduction, contamination or loss of water will have huge impact on these properties. Any guarantees that new development will not affect these properties. • Calculations based on human consumption . How much water for landscaping and sports field. If grey water is used, how much required? Will there be enough. If not enough, will it be sourced from boreholes. Impact of grey water on existing boreholes. Management system to protect kids from getting sick of grey water? 	<p>Response by HK Geohydrological Services:</p> <ul style="list-style-type: none"> • Figure 13 explains groundwater flow directions - topographical contours and groundwater contours (light blue arrows). Light green area shows area from which north eastern part of village taps its water. Dark green line forms geohydrological boundary over which groundwater cannot be tapped. BH 1, 2 & 3 of school can therefore not influence boreholes on other side of green boundary line. • Only treated effluent used on sports fields. Effluent will be of high quality with very low bacteriological counts. Safe for irrigation purposes. No additional borehole water used for irrigation.

		<ul style="list-style-type: none"> Expansion rate of school, how long before double - more space, more water? What happens on sports days or school functions where attendance doubles. Impact on water consumption? Housing project by previous owner stopped because of water and sewer issues. What changed? 	<ul style="list-style-type: none"> Water demand calculated by daily demand at normal school days times 7 to represent weekly demand. Weekends – large portion of pupils not in boarding school - water saving – used at half capacity. Sport days only on Saturdays – normal use not exceeding normal week day. Normal use calculated for boarding school fully attended. Highest demand presented by bathing and shows during normal week day. STP makes reuse of water possible – most important mitigation measure to save water. Reduce risk of aquifer contamination. Housing project was stopped due to insufficient erven sold to cover rates & taxes payable.
WJ (Jaco) Malan (87 Main St)	2019-10-01	<p>Oppose project:</p> <ul style="list-style-type: none"> Groundwater – reduction, waterbed dwindled. School's 152% usage of recharge will further reduce my available water. Where will we get water if school uses all water. Traffic – entrance and traffic hindering flow of traffic into residential area. STP – groundwater pollution and air pollution. Only as good as maintained. Hunters Rest smell 	<p>Noted.</p> <ul style="list-style-type: none"> Groundwater – from geohydrologist – borehole in different catchment than school's boreholes. Figure 13 of geohydrology study. School receive water from Rainbow Chickens and west. Water divide (geohydrological boundary) divide aquifer along the ridge in the village. North east side receives water from small enclosed groundwater catchment zone. Water level depth will therefore lower during low rainfall periods. School boreholes have no impact on 87 Main Street borehole. Traffic – Underway. STP – maintenance essential to proper functioning. Maintenance during operational phase – see EMPr – interest of project as well. Effluent from STP will be

		when driving past.	reused, optimal operation at all time essential. Enclosed / contained system – no seepage to groundwater. Smells – no open aeration tanks.
MB NPC	2019-10-01	<p>Application context:</p> <p>Competent authority: Development in Magaliesberg Biosphere Buffer zone. DEFF is responsible competent authority for applications in core and buffer. Request DEFF official contact details or instruction to defer authority to NW. Land use is agricultural – details of municipal application requested for change of land use.</p> <p>Water abstraction & use: Concern – compromise water availability for other users in the area. [reiteration of information presented in report]. Hotels & tourism facilities to the north may have an impact. Abstraction rates will reduce expected recharge from north – consider cumulative impacts of all existing and proposed development in vicinity. Compare current with proposed school, number of people and volumes. Shortfall be made up? Package STP encouraging – negating need for borehole water for irrigation. Recommend treated water to be used for toilet flushing. Encourage investigation and consideration of further grey water uses. Applicant</p>	<p>Background as per report.</p> <p>Competent authority: DEFF only handles application in core. Applications in buffer handled by Province. NW DEDECT – Ms Queen Imasiku. Change in land use – town planner – Mr Nolte Ekkerd.</p> <p>Water abstraction & use: WULA initiated with DWS. DWS will consider other water users and requirements to ensure fair distribution of available reserve without negatively impacting one particular user. DWS has details of all legal users to be considered. Misunderstanding – Three (3) boreholes will not supply two schools. Existing school has its own 3 boreholes.</p> <p>There will be no shortfall. School is considering using treated water for other purposes (such as toilet flushing) and will include in design to further reduce pressure on groundwater system.</p> <p>Yes applicant will use STP design and company furnished</p>

	<p>committed to STP design & company? Borehole monitoring protocol, impact incidents registered and reported – will I&AP have access to information upon request?</p> <p>Terrestrial habitat: [reiteration of information presented in report] Biodiversity survey on one day in winter month of July. Not conclusive. Survey required for all seasons. Further monitoring. Loss of agricultural land and natural habitat can be mitigated and offset by actively managing or rehabilitating degraded portion to the west of the R24 or managed for agricultural purposes. [reiteration of information presented in report] Introduce species of benefit to bees and other pollinators. Note alien control on unused portions to the west to prevent spread.</p> <p>Archaeological & cultural heritage: [reiteration of information presented in report]. Make SAHRA comments available with reference.</p> <p>Biosphere buffer zone: Influence of Magaliesberg on settlement pattern to north. South is rural, low population density (buffer). Development does not comply with development limitations due to population increase and</p>	<p>in report.</p> <p>I&AP welcome to access of information through proper channels.</p> <p>Terrestrial habitat: Timing comment is valid – limitation. Included comment in conclusion.</p> <p>Soil or agricultural potential assessment to advise on feasibility re managing / rehabilitating degraded portion to the west of R24.</p> <p>Rehabilitation of disturbed areas etc. to be revegetated etc. is feasible and achievable and included in recommendations / conditions (Section 11.2).</p> <p>Alien control a condition of authorisation as per Section 11.2.</p> <p>Archaeological & cultural heritage: Attached SAHRA comments (27 September 2019). SAHRA reference: 14235. School plans to keep Site 2 as it does not interfere with layout and can be used for educational purposes.</p> <p>Biosphere buffer zone: Olifantsnek village is not considered rural in nature. Not all scholars live in area (only 300). Also consider social contributions already made by school. Please provide details of other schools in Magaliesberg Biosphere.</p>
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		<p>associated water extraction. Buffer zone – low impact, sustained use economic activity that support and protects conservation objectives and ecological integrity. Consider forming a partnership with local underprivileged school in biosphere (upliftment or environmental education). Location in buffer makes it desirable to promote objectives of biosphere.</p> <p>Conclusion: Not a precedent for future development of this nature in buffer. Better suited for transition zone or fully services area. Address concerns re water supply and abstraction. Adherence to water, waste and environmental management to promote low impact sustainable development in buffer.</p> <p>WULA: Register</p> <p>Request right to further comment.</p>	
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<p>Tony Kleyn (Plot 100)</p>	<p>2019-10-01</p>	<p>Respect plans to provide schooling for youth. Provided opinion from environmentalist – to ensure aspects of effects on water supply and ecology are addressed.</p> <ol style="list-style-type: none"> 1. Waste water management: Only as good as after installation maintenance plan and management of excess water (irrigation of sports fields). Ensure no loopholes. Plans in event of crises and breakage. 2. WUL not yet received. No development prior to issue of WUL. Illustrate substantially that use of 3 boreholes do not impact on current residents – detailed specialist study. 3. Location of property in Magalieberg Biosphere Reserve buffer, CBA2, ESA1, IBA, Vulnerable Moot Plains Bushveld. 4. NW conservation goals stated. Disturbed area can be rehabilitated back to natural state. With school – conservation lost forever. 5. Conservation not addressed appropriately. 6. Better to locate school on portion of property west of R24 	<ol style="list-style-type: none"> 1. Wastewater management: Maintenance & management as well as spillages or other crisis – operational manual and EMPr. Optimal operational conditions essential for school due to reuse. DWS will also oversee this in terms of the NWA. 2. WUL: Application in progress. WUL only required for water uses, not for all aspects of development. Refer to geohydrology specialist investigation (highest category study). 3. Sensitivity: Yes as indicated in report. Considered and addressed. Also biodiversity specialist report. 4. Conservation: Agree but area surrounding this portion is already developed. Conservation of an area surrounded by development serves little purpose and ecological function already compromised. 5. See above. 6. Disagree. Portion is surrounded by rural areas.
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Public library copy	2019-09-02- 2019-10-02	None	
John Barton	2019-10-02	<p>Register.</p> <p>1. Water: Sufficient for current residents and new school (pupils & staff).</p> <p>2. Sewage: Will adequate system be installed while maintaining groundwater supply integrity.</p>	<p>Registered.</p> <p>1. Water: Refer to geohydrological study / report which addresses this.</p> <p>2. Sewage: Package STP to treat sewage to acceptable quality for reuse. Closed / contained system should not impact on groundwater.</p>
OCHOA (MacRobert Attorneys)	2019-10-02	<p>1. Introduction & background: Act on behalf of OCHOA represented by Mr Peter Minnaar.</p> <p>2. General: 2.1 Need & desirability: Reference to documents etc. – guideline, IDP, SDF, EMF, biodiversity sector plan, SPLUMA. Reiterate information from DBAR. Inadequately motivate need & desirability – service provision</p> <p>2.2 Cumulative impacts: DBAR fails to address cumulative impacts – noise, dust, traffic & groundwater</p>	<p>1. Introduction & background: Acknowledged. OCHOA is registered I&AP.</p> <p>2. General: 2.1 Need & desirability: Custodians of framework documents requested to provide comments on alignment with objectives etc. – RLM, BPDM, NW DEDECT, DEFF, & MBR. Broader societal needs (education) and public interest considered (PPP). STP and not Septic tanks & French drains as used by Olifantsnek residents – very different effect on natural water resources. Does not source water from the community borehole – refer to geohydrological investigation. School provides own services due to municipal service delivery problems.</p> <p>2.2 Cumulative impacts: Groundwater: Mr Minnaar was contacted on numerous occasions but did not respond. Geohydrologist had no access to community borehole during hydrocensus aimed at assessing groundwater users in zone of influence. Cooperation required.</p>

	<p>3. Specific:</p> <p>3.1 Identified listed activities in terms of NEMA:</p> <ul style="list-style-type: none"> • GNR 983 activity 9 – bulk transportation of water, infrastructure development • GNR 983 activity 10 - bulk transportation of sewage, infrastructure development. • GNR 983 activity 25 – sewage treatment of 2 000m³/day or more. • GNR 984 activity 9 - sewage treatment of 15 000m³/day or more. • GNR 983 activity 11 – transmission & distribution of electricity of 33kV or more. • GNR 984 activity 9 – transmission & distribution of electricity of 275kV or more. <p>3.2 Legal framework:</p> <ul style="list-style-type: none"> • SPLUMA • NEMAQA • National Veld & Forest Fire Act • National Forests Act • Etc <p>3.3 Assessment of alternatives: Not done.</p>	<p>3. Specific:</p> <p>3.1 Identified listed activities in terms of NEMA:</p> <ul style="list-style-type: none"> • GNR 983 activity 9 – Existing pipeline links boreholes (west of R24) to east of R24. Internal distribution through small diameter pipes. Activity not applicable. • GNR 983 activity 10 – Pipes smaller than 0.36m diameter and less than 120l/s throughput. Activity not applicable. • GNR 983 activity 25 – Refer to appendix G. 60m³/day STP. Activity not applicable. • GNR 984 activity 9 – Activity not applicable, see above. • GNR 983 activity 11 – 2 Eskom transformers supply power already (11kV). Activity not applicable. • GNR 984 activity 9 - Activity not applicable, see above. <p>3.2 Legal framework: Not exhaustive list</p> <ul style="list-style-type: none"> • SPLUMA – separate application by town planner to RLM. • NEMAQA – no Atmospheric emissions license, dust and dust control regulations referred to on p105 of DBAR • National Veld & Forest Fire Act – not relevant • National Forests Act – not relevant • Etc – NW legislation mentioned and considered; RLM by-laws considered and mentioned <p>3.3 Assessment of alternatives: Can be in terms of location, technology, layout etc. depending on project. Alternatives were considered – alternative site and land uses etc.</p>
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		<p>3.4 Specialist studies and impacts assessment: Land use, need & desirability, cumulative, traffic, noise, air quality, visual, surface water, socio-economic. Biodiversity in dry season.</p> <p>4. Conclusions Meeting WULA</p>	<p>Alternative layout included subsequently.</p> <p>3.4 Specialist studies and impacts assessment: Reiterated issue (no access to community borehole) re cumulative groundwater. Traffic undertaken. Noise & air not required (screening tool). Biodiversity addressed in conclusions (added).</p> <p>4. Conclusions Meeting was offered but client did not respond. WULA through eWULAas (on-line system) – Appendix G provides proof of initiation.</p>
Johannes Pretorius (Portions of Commissiesdrift Farm)	2019-10-07	<p>Concern about Hydroscintist. Should have been a public meeting.</p> <p>Landowners and neighbours kept in the dark.</p> <p>Size of development – involve all inhabitants and residential owners of surrounding area.</p> <p>No feedback received on water or sewage.</p>	<p>Late comments.</p> <p>What is concern? No legal requirement for meeting. Meeting requests from yourself & Mr Minnaar. Offered to meet.</p> <p>Nobody in the dark. Transparent process. Substantiate. Nobody viewed document in library (2 Sep – 2 Oct) though everybody was informed in July. Many landowners provided comments prior to September – included and addressed in draft document. CD with John Fourie for copies to everybody. More than 20 people involved and provided comments.</p> <p>All surrounding landowners identified and notified through our process. Through John Fourie all OCHOA members were notified and got involved.</p> <p>No feedback requested on record. First communication received.</p>

		<ol style="list-style-type: none"> 1. Water supply & usage. 2. Landowners of Portion 74 & 62 opposite R24. 3. Property next to R24 has dry boreholes and receive limited water supplies from neighbour. 4. Boreholes used for residential supplies – underground water supplies are a crises. 5. Portion 74 has 5 dry boreholes. No borehole delivering water. 6. Portion 74 boreholes drilled deeper than 100m. 2 delivering 200l/h and 900l/h – not sufficient for domestic or garden. 7. Question boreholes and report on boreholes. Not available to stakeholders & property owners. 8. Water supply from other side of R24 proof no water in development area. 9. Solicit proper answers, drawings & meeting. 	<ol style="list-style-type: none"> 1. Refer to geohydrological investigation and BAR. 2. Indicated in report – page 63 – 64 3. Noted. Not sure which property? 4. Noted, reason for geohydrological investigation. 5. Noted. 6. Noted included in hydrocensus. 7. What statement is questioned? Report compiled in compliance with regulatory requirements. Report available to everybody 2 Sep - 2 Oct. 8. Landowner has legal access to boreholes on property even if not on development footprint. 9. Please review documents available. Offered meeting.
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D.E.H. Pape (Steinfurt Boerderye)	2019-10-09	<p>Not available to provide comments by 2 October 2019. Received CD. Keep informed.</p> <p>Main concerns have been addressed. Development will have effect on surrounding property owners and environment and must be taken into consideration, not just be ignored and taken for granted as positive without problems and negative consequences.</p>	<p>Extended to provide additional time till 11 October 2019.</p> <p>Noted. All concerns captured for consideration – not ignored.</p> <p>Will keep you updated.</p>
Jan Ntemane (134 Stubb St)	2019-10-10	Register myself and Mr P Mwase.	Registered.
RLM Directorate: Community Development Unit: Integrated Environmental Management	2019-11-04	<p>Not environmentally sensitive – altered & degraded. Support development of school.</p> <p>Recommendations:</p> <ol style="list-style-type: none"> 1. Comply with mitigation measures in BAR, EMP & specialist reports. 2. Submit detailed information (design, construction methodology, sewage network layout) for STP to RLM prior to construction. 3. No provision of bulk services – threat to Olifantsnek Dam. 4. No further development supported in areas not fully serviced. Adequate service provision in place before allowing development around dams & rivers. 5. Managed with utmost care & 	<p>Noted.</p> <ol style="list-style-type: none"> 1. Agree. 2. To be submitted by applicant. 3. Noted. 4. Agree. 5. See EMP.

		<p>responsibility. Habitat disturbance not allowed.</p> <p>6. SWMP for construction & operation.</p> <p>7. Berm soil and construction stockpiles to prevent leachate and polluted runoff from leaving the site. Located more than 100m from 1:100 year flood line.</p> <p>8. Adequate storage for used and contaminated substances (petroleum products) – no threat to environment – removed and disposed to licensed facility.</p> <p>9. Appropriate & visible signalling for safety at reasonable distances at affected road intersections.</p> <p>10. Suppress dust during construction.</p> <p>11. Take increase in traffic into consideration.</p> <p>12. Establish monitoring system – impact on surface & groundwater quality.</p> <p>13. Provide sufficient, temporary ablution facilities & maintain during construction. No chemical or wastewater allowed to contaminate runoff. RLM to approve sanitary arrangements.</p> <p>14. SAHRA permission. Comply with other government departments' legislation & requirements.</p>	<p>6. See EMP re storm water.</p> <p>7. See construction EMP re soil.</p> <p>8. See construction EMP.</p> <p>9. See EMP and traffic study.</p> <p>10. See EMP re air quality.</p> <p>11. See Traffic Impact Assessment.</p> <p>12. See EMP monitoring (Section 10.6).</p> <p>13. See construction EMP.</p> <p>14. See SAHRA comments. No removal / destruction etc. planned.</p>
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9 IMPACT ASSESSMENT

9.1 Methodology

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

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

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

Nature of an impact: An impact's nature can be positive (+) or negative (-). Positive impacts are detailed in Section 10.4.2 and not rated here.

Consequence: Considers duration, extent and severity

Consequence = duration + extent + severity

Table 9-1: Environmental risk and impact assessment criteria

DURATION (D)		
Immediate	Less than 1 month	1
Short-term	2 - 11 months	2
Construction	12 - 36 months	3
Life of project	Operational phase	4
Post-closure	Time of rehabilitation and for re-establishment of natural systems	5
Residual	A permanent impact (100 years or more)	6
EXTENT (E)		
Site specific	Site of the proposed school (project area)	1
Local	Property (Portion 62) and surrounding properties	2
Regional	Rustenburg Local Municipality	3
Provincial	North West Province	4
National	Republic of South Africa	5
PROBABILITY (P)		
Rare	<5% probability of occurrence – may occur in exceptional circumstances	1
Unlikely	15% - 6% probability of occurrence – could occur at some time	2
Possible	45% - 16% chance of occurrence – might occur at some time	3
Likely	65% - 46% probability of occurrence – will probably occur in most circumstances	4
Almost Certain	90% - 66% probability of occurrence – is expected to occur	5
Definite	100%- will occur	6
SEVERITY (S)		
Catastrophic (critical)	Total change in area of direct impact, relocation not an option, death, toxic release off-site with detrimental effects, irreversible loss, huge financial loss	6

Significant (High)	> 70% change in area of direct impact due to loss of significant aspect, extensive injuries, long term loss in capabilities, off-site release to high extent, major financial implications	5
Serious	50 – 70% long-term loss, extensive rehabilitation / restoration / treatment required, high financial impact, still restricted in extent	4
Moderate (medium)	20 – 49% change, medium term loss in capabilities, rehabilitation / restoration / treatment required, on-site release with outside assistance, medium financial impact	3
Minor	10 – 19% change, short term impact that can be absorbed, on-site release, immediate containment, low financial implications	2
Insignificant (low)	< 10 % change in the area of impact, no financial implications, localised impact, a small percentage of population	1

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

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

9.2 Impact Assessment Ratings

The impacts and associated significance ratings for each phase of the project were assessed (Tables 9.2, 9.3 and 9.4). The no-go option (Table 9.5) would not meet the project objective.

The planning phase activities are considered to be of a negligible impact significance as these typically involve desktop assessment and site inspections. A very low temporary impact may be experienced due to the increased presence of humans and vehicles / machinery.

Table 9-2: Construction Phase Impacts and Significance

Aspect and description		Impact rating (before mitigation)							Impact Rating (after mitigation)						
Aspect	Description	Nature of Impact (Positive / Negative)	Spatial Scale/ Extent (6)	Duration (6)	Severity (6)	Consequence	Probability (6)	Significance (108)	Nature of Impact (positive / Negative)	Spatial Scale/ Extent (6)	Duration (6)	Severity (6)	Consequence	Probability (6)	Significance (108)
Land Use	Loss of agricultural land	N	1	4	4	9	6	54	N	1	4	2	7	6	42
Flora	Destruction of, and fragmentation of, portions of vegetation community (vulnerable vegetation type)	N	2	4	4	10	4	40	N	2	4	3	9	3	27
	Loss of portions of CBA2 and ESA 1 (floral species lost)	N	2	4	3	9	6	54	N	2	4	3	9	3	27
	Increase in invasive plant species	N	1	5	3	9	4	36	N	1	1	2	4	2	8
Fauna	Destruction and loss of habitat and corridor connectivity	N	2	4	3	9	3	27	N	2	4	2	8	2	16
	Mortalities (reduction in animal population and species composition)	N	1	3	4	8	3	24	N	1	3	4	8	2	16
	Displacement of faunal community (including SCC) due to habitat loss, disturbance (noise, dust, vibration)	N	1	4	3	8	3	24	N	1	3	2	6	2	12
	Loss of section of Magaliesberg IBA	N	2	4	3	9	4	36	N	2	4	3	9	2	18
Soils	Soil erosion	N	1	3	3	7	4	28	N	1	3	2	6	2	12
	Soil Pollution due to construction materials	N	1	3	3	7	4	28	N	1	3	2	6	2	12
Waste Management	Construction Waste / Material and Litter	N	1	3	5	9	6	54	N	1	3	2	6	3	18
Air Quality & Noise	Dust due to earthworks	N	2	3	3	8	5	40	N	1	3	1	5	2	10
	Emissions from vehicles & equipment	N	1	3	2	6	3	18	N	1	3	1	5	2	10
	Noise generation	N	2	3	3	8	3	24	N	1	3	1	5	2	10
Water	Pollution of Surface Runoff	N	1	3	4	8	3	24	N	1	3	2	6	2	12
	Contamination of Groundwater	N	1	3	4	8	3	24	N	1	3	2	6	2	12
	Increase in runoff volume	N	1	3	3	7	3	21	N	1	3	2	6	2	12
Socio-economic	Health and Safety of construction workers	N	1	3	4	8	3	24	N	1	3	1	5	2	10
	Traffic	N	2	3	3	8	3	24	N	2	3	2	7	2	14
	Criminal Activity	N	2	3	2	7	3	21	N	2	3	2	7	2	14

Aspect and description		Impact rating (before mitigation)						Impact Rating (after mitigation)							
Aspect	Description	Nature of Impact (Positive / Negative)	Spatial Scale/ Extent (6)	Duration (6)	Severity (6)	Consequence	Probability (6)	Significance (108)	Nature of Impact (positive / Negative)	Spatial Scale/ Extent (6)	Duration (6)	Severity (6)	Consequence	Probability (6)	Significance (108)
	Impact on local economy	P	/	/	/	/	/	/	P	/	/	/	/	/	/
	Job creation	P	/	/	/	/	/	/	P	/	/	/	/	/	/
	Education	P	/	/	/	/	/	/	P	/	/	/	/	/	/

Table 9-3: Operational Phase Impacts and Significance

Aspect and description		Impact rating (before mitigation)							Impact Rating (after mitigation)						
Aspect	Description	Nature of Impact (positive / Negative)	Spatial Scale/ Extent (6)	Duration (6)	Severity (6)	Consequence	Probability (6)	Significance (108)	Nature of Impact (positive / Negative)	Spatial Scale/ Extent (6)	Duration (6)	Severity (6)	Consequence	Probability (6)	Significance (108)
Flora	Continued disturbance of vegetation communities (ESA1, CBA2 & Vulnerable vegetation type)	N	2	6	3	11	3	33	N	2	6	3	11	3	33
	Increase in / encroachment by alien invasive plant species	N	1	4	4	9	4	36	N	1	4	3	8	2	16
Fauna	Attraction / introduction of pest faunal species (flies, rats etc.)	N	2	4	4	10	4	40	N	2	4	2	8	2	16
	On-going displacement, direct mortalities and disturbance of faunal community due to habitat loss and disturbances	N	2	4	4	10	4	40	N	2	4	3	9	3	27
Soils erosion	Soil erosion	N	1	4	2	7	2	14	N	1	4	1	6	1	6
	Soil Pollution	N	1	4	3	8	3	24	N	1	4	2	7	1	7
Waste Management	Operational Waste / Material and Litter	N	1	4	3	8	3	24	N	1	4	2	7	1	7
Air Quality and Noise	Emissions from vehicles & equipment	N	1	4	2	7	3	21	N	1	4	1	6	2	12
	Noise generation	N	2	4	2	8	3	24	N	2	4	2	8	3	24
Water	Pollution of Surface Runoff	N	1	4	3	8	3	24	N	1	4	2	7	1	7
	Contamination of Groundwater	N	2	4	3	9	3	27	N	2	4	2	8	1	8
	Reduced water availability	N	2	4	3	9	3	27	N	2	4	2	8	3	24
	Storm water (runoff) management	N	1	4	3	8	3	24	N	1	4	2	7	1	7
Socio-economic	Health and Safety	N	1	4	4	9	3	27	N	1	4	2	7	1	7
	Traffic	N	2	4	2	8	3	24	N	2	4	1	7	2	14
	Impact on local economy	P	/	/	/	/	/	/	P	/	/	/	/	/	/
	Job creation	P	/	/	/	/	/	/	P	/	/	/	/	/	/
	Education	P	/	/	/	/	/	/	P	/	/	/	/	/	/

Table 9-4: Decommissioning Phase Impacts and Significance

Not applicable to this project.

Table 9-5: No-go Impacts and Significance

Aspect and description		Impact rating (before mitigation)						
Aspect	Description	Nature of Impact (positive / Negative)	Spatial Scale/ Extent (6)	Duration (6)	Severity (6)	Consequence	Probability (6)	Significance (108)
Land use	Development potential lost Land used for residential purposes as per SDF (secondary impacts expected)	N	1	6	3	10	4	40
Socio-economic	No new employment opportunities and increase in local economy. No expansion of education facility and opportunities.	N	2	6	4	12	5	60

10 ENVIRONMENTAL MANAGEMENT PROGRAMME

10.1 Alterations to the EMPr

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

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

10.2 Responsibility

REC Establishers (Pty) Ltd will be responsible for the implementation of all mitigation and management measures as well as the compliance with this EMP and any license and authorisation conditions. REC Establishers (Pty) Ltd will delegate its responsibilities to an Environmental Officer (EO). Each contractor involved in the project will comply with the EMPr.

The EO will be suitably qualified to perform the necessary tasks and will be appointed at a level such that he/she can interact effectively with site contractors, labourers and the public.

The EO will be required to perform the following tasks:

- Monitoring and execution of the EMPr by maintaining a permanent presence on site;
- Inspect the site as required to ensure adherence to the management actions of the EMPr and authorisations/licences (internal audits);
- Complete Site Inspection Forms on a regular basis (weekly / monthly);
- Provide inputs to the regular (e.g. monthly) environment report to be prepared;
- Liaise with contractors on issues relating to implementation of, and compliance with, the EMPr and authorisations/licences;
- Maintain a record of environmental incidents (spills, impacts, legal transgressions etc.) as well as corrective and preventive actions taken; and
- Maintain a public complaints register in which all complaints are recorded.

The conditions of the authorisation/licences and EMPr will be brought to the attention of all persons (employees, teachers, scholars, workers, consultants, contractors etc.) associated with the undertaking of these activities and REC Establishers (Pty) Ltd will take such measures that are necessary to bind such persons to the conditions thereof (contracts with penalties for non-compliances).

REC Establishers (Pty) Ltd can further enforce this by running workshops with employees in order to raise environmental awareness. These workshops should cover aspects such as fire prevention, strict use of ablution facilities and general duty of care. A pamphlet can be

handed out on socially acceptable and environmentally responsible conduct such as water conservation, waste management etc.

Entity:	Responsible Person:	Contact details:
REC Establishers (Pty) Ltd	Mr Paul Peens (Director)	076 197 0002
Environmental Officer (SHEQ manager)	To be appointed	

10.3 Activities causing potential impacts

Impacts may arise from the following activities during each of the project phases:

Construction Phase:

- Removing trees and vegetation.
- Stripping and stockpiling soil.
- Excavation for building foundations.
- Cement mixing and construction of foundations, storm water drainage, service infrastructure etc.
- Construction of school and supporting buildings as well as sports fields.
- Generation and handling of waste.

Operational Phase:

- Education and boarding – presence of scholars
- School events (sports etc.) – large quantity of people.
- Utilisation of ablution / toilets and wastewater (sewage) handling.
- Generation of waste (estimated 3 250 kg/week).
- Traffic in the morning (6:30 – 7:30) with 240 trips in and out and midday (14:00 – 15:00) with 105 trips in and out (EPS, 2019)

10.4 Potential Impacts

Based on the identified impacts and associated significance ratings provided in the impact assessment, the following potential (negative and positive) impacts have been identified as being key to the two (2) phases (construction and operation) of the preferred option for the proposed project:

10.4.1 Negative Impacts

Construction phase (Short term)

- Land Use: Permanent loss of agricultural potential on project area, which constitutes ±60% of the property. Aesthetics during construction.
- Fauna & flora: The project area will be cleared of all vegetation and therefore any fauna habitat on the project area will also be destroyed. The project area is in a CBA2, ESA1, Magaliesberg IBA, MBR buffer and within the Moot Plains Bushveld, which is considered vulnerable. The project area has, however, been disturbed before and is therefore rated as of moderate sensitivity due to the remains of Secondary Bushveld.
- Soils: Soils will be prone to erosion during construction due to vegetation removal and earth works (see Rocksoil Consult, 2019).

- Waste management: Waste should be managed according to the waste management hierarchy – prevention, minimisation, recycling / reuse, treatment, disposal.
- Air quality: Dust due to earth works.
- Water: Earthworks and compaction of soil by heavy vehicles used during construction could lead to increased surface runoff quantity, flow velocity and erosion. The use of building materials can cause pollution to water.
- Socio-economic: Construction worker safety should be a priority. Traffic control on public roads is important to ensure public safety and prevent accidents due to the movement of construction vehicles on public roads.

Operational phase (Indefinitely)

- Fauna & Flora: The control of alien invasive species is important since these already exist on the property and their prevalence increase with any disturbance.
- Waste management: Waste should be managed according to the waste management hierarchy – prevention, minimisation, recycling / reuse, treatment, disposal.
- Air quality & noise: Noise due to children talking and playing as well as events.
- Storm water management: Manage storm water to prevent negative impacts on site and on the property and surrounding area. A storm water management system must be in place to decrease the volume and velocity of surface runoff, as well as to manage potential pollution of storm water (separate wastewater management system).
- Groundwater contamination: Groundwater can be contaminated if wastewater (sewage) is not properly managed.
- Groundwater abstraction: Other groundwater users (potentially one) may be affected in terms of the borehole water abstraction quantities due to the school water supply requirements.

10.4.2 Positive impacts

Positive impacts will occur and include the following benefits:

- Job creation during the construction phase and operational phase.
- Opportunities for skills development.
- Increased earning power of the local people and improvement in the local economy.
- Re-vegetation during landscaping.
- Establishment of educational facilities.
- High level of accessibility, which makes locality desirable.

10.4.3 No-go Option impacts

The aspects below are impacted upon if the no-go option is selected. Mitigation for these impacts includes the continuation of the proposed project.

- Land use:
 - Property will remain agricultural land with agricultural zoning. Potential agricultural use of land though property is split into two (2) portions by the R24. Western portion of property will remain available for agricultural purposes irrespective.
 - Development for alternative use. Property may be used for residential purposes as per the SDF.
 - Development potential will be lost.
- Socio-economic: The positive impacts (Section 10.4.2) will not be realised.

10.5 Management measures

Dedicated measures have been identified to manage the impacts identified above (Table 10.1). The purpose of the EMPr is to ensure that undue or reasonably avoidable adverse impacts of the project are prevented; that impacts which cannot be prevented are managed to reduce their significance; and that the positive benefits of the project are enhanced. REC Establishers (Pty) Ltd (the applicant) is responsible for the implementation of recommendations and mitigation / management measures and HydroScience cannot and will not take responsibility for the actions of REC Establishers (Pty) Ltd or lack thereof.

Table 10-1: Identified potential impacts and proposed management measures for the Construction Phase

CONSTRUCTION PHASE		
Aspect:	Potential impact:	Management measures:
Land Use	<ul style="list-style-type: none"> • Loss of agricultural land. • Construction activities may lead to displeasing aesthetics, such as the storage of materials, excavation activities and the use and storage of construction machines / vehicles / equipment. 	<ul style="list-style-type: none"> • The visual impact is limited to the construction phase and therefore of short duration. • The loss of agricultural potential and land use is permanent on the project area. • Based on the SDF, the project was going to be developed and would therefore have been lost for agricultural purposes in any event. • The project area is ±60% of the property and therefore agricultural potential is not permanently lost for the entire property since the portion west of the R24 remains available for agricultural purposes and land use. • All storage areas should be marked as "Laydown" areas, should be barricaded and kept neat and tidy at all times. • Housekeeping should be done daily.
Flora (clearance of vegetation)	<ul style="list-style-type: none"> • Destruction of, and fragmentation of, portions of vegetation community (vulnerable vegetation type). • Loss of portions of CBA2 and ESA 1 (floral species lost). • Increase in invasive alien plant species and spread to surrounding area leading to species loss on a larger scale. 	<ul style="list-style-type: none"> • Sections of project footprint has already been modified or disturbed (agricultural activities, waste dumping etc.). • No floral SCC were noted. If found, relocate prior to and during construction. • Limit clearance of vegetation to the project footprint area and not beyond. Demarcate areas to limit impacts. No access, movement / activities outside demarcated areas. • Remove all exotic / alien invasive species as CARA and NEMBA Alien and Invasive Species Lists requires. In particular, Category 1b species identified (<i>Argemone ochroleuca</i>, <i>Cereus jamacaru</i>, <i>Datura ferox</i>, <i>Eucalyptus camaldulensis</i>, <i>Melia azedarach</i>, <i>Opuntia ficus-indica</i>). Also remove from area west of the R24. • Alien invasive species should be stopped from spreading to disturbed areas. Take care to avoid the spread of alien invasive species to the surrounding areas, through the physical removal by hand and removal during the season where the spread of the seeds is limited. • Remove alien invasive seedlings and sapling as they become evident during the construction phase. • Prepare and implement an alien invasive plant management and monitoring programme from the outset once authorization has been granted as it takes at least three (3) years to break the cycle of regeneration. This plan needs to make provision for the on-going management of alien invasive vegetation in the long-term to prevent encroachment and spreading of invasive and exotic species. • All construction vehicles, equipment and machinery should be free of plant material. Cleaning of vehicles prior to entering construction site. • Re-vegetate denuded areas with indigenous vegetation to prevent erosion during storm events and encroachment by alien invasive species. • Make use of existing roads, accesses and walking paths where possible.

CONSTRUCTION PHASE		
Aspect:	Potential impact:	Management measures:
Fauna	<ul style="list-style-type: none"> • Destruction and loss of habitat and corridor connectivity. • Mortalities (reduction in animal population and species composition). • Displacement of faunal community (including SCC) due to habitat loss, disturbance (noise, dust, vibration). • Loss of section of Magaliesberg IBA. 	<ul style="list-style-type: none"> • Limit development to project footprint area. Demarcate areas to limit impacts. No access, movement / activities outside demarcated areas. Keep areas of physical disturbance as small as possible. • Plan and implement a storm water management plan. • Maintain indigenous trees, which will not hamper development. • Demarcate development area to prevent disturbance to surrounding areas thereby ensuring these are maintained in their existing state. • Areas, not targeted for development but impacted or damaged should be rehabilitated as soon as possible. • Keep the construction period as short as possible. • In the case of noting the Giant Bullfrog on or near the site during the November – December breeding season, cease all activity. Plan activities outside the breeding season. • Environmental awareness training (Section 10.8) for staff: <ul style="list-style-type: none"> ○ to raise awareness of the SCC to prevent regional decline in numbers and diversity. ○ to ensure management of waste to prevent poisoning of fauna. ○ to store and handle harmful substances to prevent fauna being exposed to these. • Use quieter equipment to limit disturbance to fauna that wants to remain in the area. • Enclose noisy point-sources and fit equipment and machinery with silencers. • Plant indigenous trees and plants in landscaped area of project area. • Create a green area to attract local bird species back. Install bird boxes. • Suppress dust through water sprinkling. • Compile and implement an alien invasive management plan. • Do not feed wildlife. • Food, food waste and domestic waste must be placed in sealed containers and not exposed on site. • Ensure outside areas are kept clean and tidy. • Provide adequate waste removal services (waste management plan) to prevent the attraction of rodents, pests and other alien scavenging species. • No deliberate killing or trapping of fauna. Only trap species, which become trapped in the project area to safely remove from site (specialist) but preferably afford them the opportunity to move away on their own. • Ensure safe speed limits and working conditions. • Implement speed limits and humps to lower the risk of road killings. • Make use of existing roads, accesses and walking paths where possible. • Cumulative: Site is disturbed and neighboured by other developments (Olifantsnek residential area) and roads (R24, Third Avenue, Stubb Street, Main Road). Site provides little in terms of ecological connectivity. Environmental awareness training to prevent significant decrease of fauna biodiversity in the area.

CONSTRUCTION PHASE		
Aspect:	Potential impact:	Management measures:
Soils	<ul style="list-style-type: none"> • Soil erosion due to exposed soils (due to vegetation removal) and earth works. Soils were found to be erodible if subject to concentrated water flow (Rocksoil Consult, 2019). • Soil compaction due to earth works. • The physical removal of soil / silt. 	<ul style="list-style-type: none"> • Re-vegetate denuded areas with indigenous vegetation to prevent erosion during storm events. • Refer to storm water management - Appropriate erosion control and water diversion structures should be constructed so that the loosened, exposed soil is not left vulnerable to erosion. • Erosion control plans should be formulated as well as implemented through the construction process. • All vehicles are to remain on the designated routes to access and exit the site to minimize soil erosion and compaction. • Stockpile excavated soil as per the soil utilisation guide. • Keep topsoil stockpiles loose and surface moist. • Utilise stockpiled soil across the site asap. • Refer to geotechnical engineering recommendations.
	<ul style="list-style-type: none"> • Pollution by oil spills and incorrect handling, storage and disposal of construction material. 	<ul style="list-style-type: none"> • Vehicles, equipment and machinery must be inspected daily as to identify potential oil leaks. • Vehicles shall not refuel on site. • No planned on-site maintenance of construction vehicles, equipment and machinery. • Use drip trays for emergency maintenance to catch spills. • Construction materials to be stored under roof on impervious base or in containers to prevent rain damaging the material resulting in the generation of waste (materials can no longer be used) and contaminated rainwater flowing into the environment. • Areas, not targeted for development but impacted or damaged should be rehabilitated as soon as possible.
Waste Management	<ul style="list-style-type: none"> • Improper handling and disposal of waste will impact on soil, groundwater and surface runoff. • General waste will accumulate during the construction phase due to construction workers. • Poor solid waste management practises can lead to contamination and unsightly areas, as well as pests and odours with associated health issues. • Solid construction waste generated through construction activities (building rubble). • Hazardous waste in the event of 	<p><u>Prevention of waste:</u></p> <ul style="list-style-type: none"> • Material storage – material storage areas should be safe, secure and weather-proofed to prevent damage to material (resulting in waste generation) and theft. Roofed area with impermeable base or on sealed containers. • Due to the additional movement of people, there will be increased litter production and higher probability of littering. Therefore, there should be on-site signs raising the awareness of the impacts of littering on the natural environment and weekly litter patrols to collect litter. • Train staff/contractors to operate in an environmentally responsible manner (closing of taps for water conservation, reporting spills, no littering etc.). <p><u>Reduction / minimisation of waste:</u></p> <ul style="list-style-type: none"> • Reduce waste quantities and disposal costs through a reduction in the materials ordered. • “Take-back” schemes – setting up schemes with suppliers to take back surplus materials. • Collect waste in suitable containers (drums / skips / bins on site). • Engage with the supply chain to supply products and materials that use minimal packaging. <p><u>Reuse / recycling of waste:</u></p> <ul style="list-style-type: none"> • Separate / sort waste for collection and recycling - make arrangement with recycling contractors

CONSTRUCTION PHASE		
Aspect:	Potential impact:	Management measures:
	<p>a hydrocarbon spillage/leak (construction equipment or vehicles).</p> <ul style="list-style-type: none"> General waste produced by builders (biodegradable and non-biodegradable). 	<p>to provide clearly marked bins for material separation / sorting. Make sure that contractors are aware of the placement of the bins and their responsibility to separate / sort materials.</p> <ul style="list-style-type: none"> Though no special disposal methods are required for non-hazardous waste, non-biodegradable refuse such as glass bottles, plastic bags, etc., must be stored in suitable containers to allow for recycling and emptied on an as-required basis for recycling purposes during the construction and clean-up phase. Segregate packaging for reuse. <p><u>Waste handling on site:</u></p> <ul style="list-style-type: none"> Separate / sort waste. Waste containers must have covers to prevent rainwater infiltration. Waste containers should be marked, or colour coded to indicate which types of waste can be disposed to it. Ensure sufficient containers are available for storage of waste prior to removal off site to prevent overflow and littering on the site and surroundings. Ensure no litter, refuse, waste and rubble generated on the premises will be placed, dumped or deposited on this site, adjacent or surrounding properties during the construction and clean-up phase. Waste must be disposed, as soon as possible to a municipal transfer station, skip or on a licensed landfill site. Waste must not be allowed to stand on site to decay, resulting in malodours and attracting pests. All skips are to have secure covers that will not allow entry to the skip by fauna in any way, skips must not to be left standing without a cover as this may attract fauna to inspect the skip and possibly cause death or injury to the fauna. Waste may not be burnt on site. Hazardous waste must be stored separately from general waste on an impermeable surface within a bund wall and disposed of at a hazardous waste site if not recycled. <p><u>Waste removal & disposal:</u></p> <ul style="list-style-type: none"> Remove waste from site for disposal to the local licensed municipal landfill / waste management facility on a regular basis (at least weekly or when skip is full) - removal by the construction contractor or another contractor (Van der Westhuizen). No burning or burying of waste. No planned maintenance or servicing of vehicles / machinery / equipment on site. If emergency maintenance is required to onsite vehicles, machinery and/or equipment, drip trays and / or absorbent mats will be placed underneath the vehicles / machinery / equipment where maintenance work is conducted to prevent grease/oil spillages impacting the environment. Any hazardous substances will be handled according to the relevant legislation relating to transport, storage and use of the substance (Safety Datasheets). Portable dry chemical toilets should be provided by the construction contractor for workers.

CONSTRUCTION PHASE		
Aspect:	Potential impact:	Management measures:
		<p>Chemical toilets should be serviced as required to prevent overflows. Construction contractor will ensure that there are an appropriate number of mobile dry chemical toilets on site (typically 1 toilet for 20 people). Contractor to provide suitable ablution facilities (washing and changing area) for construction workers, no builders / workers will be housed on the site. Ablutions outside the provided facilities are not to occur under any circumstances (no “go to the bush”).</p> <p><u>Documentation:</u></p> <ul style="list-style-type: none"> Contractors to report on the quantities of different waste streams they manage (landfill, reuse, recycling, energy recovery). Ensure copies of all waste manifests (safe disposal certificates) are kept, showing responsible handling, transport and disposal by a reputable waste handler. Include measure in contract that will ensure contractors are required to clean their work area after construction.
<p>Air quality & Noise</p> <p>Emissions from vehicles and equipment</p> <p>Noise generation</p>	<p>Dust</p> <ul style="list-style-type: none"> Dust may result from earthworks. Dust generation may impact the surrounding roads and properties. Safety hazard if large amounts of dust are blown across the roads. Dust may disturb the residents of the surrounding area (inhalation / ingestion / nuisance). 	<ul style="list-style-type: none"> Water sprays and dust suppression surfactants must be used to limit dust generated if required. A complaints register must be kept throughout the construction and operational phase. A Dust Minimization Plan must be put in place and implemented through the entire construction phase. Compliance with dust regulations (GNR 517 of 25 May 2018). In high wind conditions, the frequency of the minimisation of dust must be increased. All stockpiles must be covered with tarpaulins.
	<p>Emissions</p> <ul style="list-style-type: none"> Vehicles, equipment and machinery (carbon monoxide emissions, smoke). Solvents, and Malodours as a result of waste not being removed from the construction site. 	

CONSTRUCTION PHASE		
Aspect:	Potential impact:	Management measures:
	<p>Noise</p> <p>Noise from construction activities, construction vehicles moving to and from site, noise from excavation activities.</p>	<ul style="list-style-type: none"> • Noise will be limited and only occur within working hours (7:00 – 17:00 daily during weekdays). • The contractor is to abide by the by-laws of the local municipality relating to noise control. • Neighbours should be informed of planned high noise activity prior to commencement. • Ear plugs are to be worn by construction workers as and when required. • The construction contractor will ensure vehicles are road worthy. • Proper lubrication and improved maintenance of machines. • Designing, fabricating and using quieter machines to replace the historically noisy ones. • Enclose noisy point-sources and fit silencers if quieter equipment is not available. • Reducing the noise produced from a vibrating machine by vibration damping i.e. placing a layer of damping material (rubber, neoprene, cork or plastic) beneath the machine. <p><u>Reduce noise from vehicles by:</u></p> <ul style="list-style-type: none"> • turning off engines when they are not in use; • checking the brakes are properly adjusted and don't squeal; • no revving the engine unnecessarily; • only using the horn in emergencies; and • replacing exhaust systems as soon as they become noisy
Water quality / quantity	<p>Pollution of surface runoff</p> <ul style="list-style-type: none"> • Incorrect handling and spillage of building materials and hydrocarbons. • Spillages can cause soil, surface runoff and groundwater contamination. • Due to the removal of vegetation, runoff can wash sediment away causing erosion on the site and runoff with a high sediment load. 	<ul style="list-style-type: none"> • Construction should preferably take place in the dry season, as surface water runoff is minimal. • A storm water management plan must be established and implemented throughout the construction phase. • No uncontrolled discharge from the site should be permitted. • Surface run-off from construction sites should be discharged into storm water drains via adequately designed sand / silt removal facilities such as sand traps, silt traps and sediment basins to reduce siltation in storm water drains. • Channels or earth bunds or sand bag barriers should be provided on site to properly direct storm water to such silt removal facilities. • Silt removal facilities should be maintained, and the deposited silt and grit should be removed regularly, to ensure that these facilities are functioning properly at all times. • Wastewater generated from the washing down of mixer trucks and drum mixers and similar equipment should wherever practicable be recycled.
	<p>Contamination of groundwater</p> <ul style="list-style-type: none"> • Incorrect and irresponsible practices of construction workers when storing, handling and disposing hazardous substances. • Potential of construction activities 	<ul style="list-style-type: none"> • Natural: Sand and silt on site have a minimal to medium capacity to absorb contaminants but medium to high capacity to create an effective barrier to the movement of contaminants (soil weather to clayey matrix with low permeability). Low risk due to medium to long distance to water table (10 to 15 metres surface to aquifer). Vulnerable to inorganic pollutants (nitrates, phosphates and chlorides) but with negligible risk of organic or microbiological contaminants (bacteria and viruses) due to 40-day period for breakdown.

CONSTRUCTION PHASE		
Aspect:	Potential impact:	Management measures:
	<p>and material to transfer hazardous substances to the surrounding environment.</p> <ul style="list-style-type: none"> • Inappropriate ablution facilities. • Construction workers may transfer contaminants to the surrounding environment. • Inappropriate responses to spillages of hazardous waste. 	<ul style="list-style-type: none"> • Portable chemical toilets should be kept away from sensitive drainage areas and should be sealed units with waste taken off-site to a suitable sewage facility for treatment. These should be well maintained and regularly cleaned and sewage should not be allowed to directly access the groundwater. "Go to the bush" must be prohibited. • Contractor must ensure that all building materials / chemicals are effectively stored (sealed containers) and managed (mixing etc.) to prevent contamination. • All vehicles, machinery and equipment shall be properly maintained and serviced so that no oil leaks occur on site. • In the unlikely event of a spillage, sufficient clean-up procedures must be carried out immediately (spill kits to be available on site). • All reagents, reagents storage tanks and mixing units must be supplied with a bunded area (bund wall) built to contain 110% of the capacity of the facility, to contain any spilled material and return back into the system if possible. The system must be maintained in a state of good repair and standby pumps must be provided. No mixing of cement on uncovered soil. • Monitor BH1, 2 & 3 as per the monitoring programme (Section 10.6). • Construction of the site shall be in accordance with recognised civil engineering practices.
	<p>Storm water management:</p> <ul style="list-style-type: none"> • Impermeable surfaces (such as roofed buildings, concrete surfaces, parking areas and roads) minimise the surface area available for water infiltration and prevents the effective infiltration of precipitation into the soils and therefore leads to an increase in surface water flow volumes to be managed as well as the velocity at which it flows. • This may also lead to erosion. 	<ul style="list-style-type: none"> • If feasible, construction should preferably occur in the dry season, when surface water runoff is minimal. • A storm water management plan must be established and implemented throughout (include in final layout). • Construction vehicles must be limited to one path to reduce compaction of soil, which increases surface runoff. • Design the site with a smaller area of impervious surfaces. Large areas of the site will be for sport fields, which will still allow surface runoff to infiltrate naturally. • The use of low impact development techniques is preferred to intercept and infiltrate runoff from developed areas distributed throughout the site. • The cost of storm water implementation, management and maintenance, as well as flood risk, can be greatly reduced by identifying, retaining and enhancing the natural areas along which runoff flows. Alteration of existing drainage patterns must therefore be avoided. • Rainwater harvesting should be considered to capture runoff from roofs and use of this water in landscaped / garden areas /sport fields.
Socio-economic	<p>Health & safety</p> <ul style="list-style-type: none"> • Health impacts (injury etc.) and environmental damage. • Health and safety risks include, but are not limited to, vehicle 	<ul style="list-style-type: none"> • Compliance with Occupational Health and Safety Act (OHSA), 1983 (Act 85 of 1983). • Applicable Personal Protective Equipment (PPE) to be worn on site.

CONSTRUCTION PHASE		
Aspect:	Potential impact:	Management measures:
	<p>movement, construction activities, live operating construction machinery and excavations.</p>	
	<p>Traffic</p> <ul style="list-style-type: none"> • Traffic flow may be impacted due to the presence of slow moving construction vehicles on public roads. • Heavy vehicles may damage the roads. 	<ul style="list-style-type: none"> • Avoid disrupting the traffic in the Olifantsnek area by preventing construction vehicles on public roads during peak hours. • The Traffic Management Plan should include clever use of time and road access routes to reduce the amount of interaction between normal traffic and construction vehicles. • If any vehicle has damaged the road, infrastructure or surrounding properties, the contractor is responsible to complete appropriate repairs in line with the relevant authorities' requirements. • There must be adequate space for deliveries and parking on the site as indicated on the layout drawing. • All construction vehicle drivers will be trained in terms of driving protocols i.e. adhering to speed limits, ensuring materials are safely secured etc. • All construction vehicle drivers must be in possession of a valid drivers licence. The credentials of the drivers will be verified by the construction contractor. • Signboards will be placed on both sides of all access roads to make the public aware of slow-moving construction vehicles entering and exiting the site. • No construction material must obstruct vehicle movement on public roads.
	<p>Criminal activity</p> <ul style="list-style-type: none"> • Increased criminal activity due to the opportunity to steal construction equipment and materials from site. 	<ul style="list-style-type: none"> • A security company should be appointed to safely guard the site during and after operations. • A security guard will keep watch during non-working hours to prevent illegal access and security problems on the site or the surroundings. • The site is enclosed (fenced) for the purposes of access control. • No loitering will be allowed. • No ad-hoc employment in construction area as this will encourage job-seekers to loiter in the area.
Cultural and heritage	<p>Possible subterranean presence of archaeological and/or historical sites, features or artifacts.</p>	<p>Uploaded project onto the SAHRIS website and received comments. Permit required to remove the stone monolith (site 2). Operating controls and monitoring should be aimed at the possible unearthing of archaeological and/or historical sites, features or artifacts. Care should be taken when development commences that if any of the above are discovered, a qualified archaeologist be called in to investigate the occurrence (Archaetnos, 2019). Contact SAHRA APM Unit (Natasha Higgitt / Philip Hine on 021 462 5402) if any evidence of archaeological site / remains. Contact SAHRA BGG Unit (Thingahangwi Tshivhase / Mimi Seetlo on 012 320 8490 if unmarked</p>

CONSTRUCTION PHASE

Aspect:	Potential impact:	Management measures:
		human burials arte uncovered.

Table 10-2: Identified potential impacts and proposed management measures for the Operational Phase

OPERATIONAL PHASE		
Aspect	Potential impact:	Management measures:
Flora	<ul style="list-style-type: none"> • Continued disturbance of vegetation communities (ESA1, CBA2 & Vulnerable vegetation type) • Increase in / encroachment by alien invasive plant species 	<ul style="list-style-type: none"> • Limit clearance of vegetation to the project footprint area and not beyond. Demarcate areas to limit impacts. No access, movement / activities outside demarcated areas. • Remove all exotic / alien invasive species as CARA and NEMBA Alien and Invasive Species Lists requires. In particular, Category 1b species identified (<i>Argemone ochroleuca</i>, <i>Cereus jamacaru</i>, <i>Datura ferox</i>, <i>Eucalyptus camaldulensis</i>, <i>Melia azedarach</i>, <i>Opuntia ficus-indica</i>). Also remove from area west of the R24. • Alien invasive species should be stopped from spreading to disturbed areas. Take care to avoid the spread of alien invasive species to the surrounding areas, through the physical removal by hand and removal during the season where the spread of the seeds is limited. • The alien invasive plant management and monitoring programme needs to make provision for the on-going management of alien invasive vegetation in the long-term to prevent encroachment and spreading of invasive and exotic species.
Fauna	<ul style="list-style-type: none"> • Attraction / introduction of pest and exotic / alien faunal species (flies, rats etc.). • On-going displacement, direct mortalities and disturbance of faunal community due to habitat loss and disturbances. 	<ul style="list-style-type: none"> • Limit activities to project footprint area. Demarcate areas (boundary wall / fence) to limit impacts. No access, movement / activities outside demarcated areas. • Plan and implement a storm water management plan. • Environmental awareness training (Section 10.8) for staff and scholars: <ul style="list-style-type: none"> ○ to raise awareness of the SCC to prevent regional decline in numbers and diversity. ○ to ensure management of waste to prevent poisoning of fauna. ○ to store and handle harmful substances to prevent fauna being exposed to these. • Do not feed wildlife. • Food, food waste and domestic waste must be placed in sealed containers and not exposed on site. • Ensure outside areas are kept clean and tidy. • Waste management: Food, food waste and domestic waste must be placed in sealed containers and not exposed on site. Provide adequate waste removal services (waste management plan) to prevent the attraction of rats and other alien scavenging species. • No deliberate killing or trapping of fauna. • Ensure safe speed limits and conditions. • Ensure outside areas are kept clean and tidy.
Soil pollution	<ul style="list-style-type: none"> • Accidental spills. • Incorrect and irresponsible storage and handling of hazardous substances. 	<ul style="list-style-type: none"> • Refer to storm water management. • The re-vegetation (sport fields) will act against the effects of soil erosion as it will provide a surface area for the absorption of surface runoff, thus decreasing soil erosion potential and silt carried in runoff.

OPERATIONAL PHASE		
Aspect	Potential impact:	Management measures:
<p>Waste Management</p> <p>(3 250 kg/week or 170 tons/annum as per EPS Consulting Engineers calculations)</p>	<ul style="list-style-type: none"> General waste produced by staff and scholars. Waste removal services are required. The use of recycle bins is advised. Waste not properly managed could result in pollution of the surrounding environment. 	<p>As per the construction phase.</p> <p><u>Prevention of waste:</u></p> <ul style="list-style-type: none"> Material storage – material storage areas should be safe, secure and weather-proof to prevent damage to material (resulting in waste generation) and theft. <p><u>Reduction / minimisation of waste:</u></p> <ul style="list-style-type: none"> Reduce waste quantities and disposal costs through a reduction in the quantities ordered. Collect waste in suitable containers (bins/domes on site). Engage with the supply chain to supply products and materials that use minimal packaging. <p><u>Reuse / recycling of waste:</u></p> <ul style="list-style-type: none"> Separate / sort waste for collection and recycling - make arrangement with recycling contractors to provide clearly marked bins / domes for material separation / sorting. Make sure that staff and scholars are aware of the placement of the bins / domes and their responsibility to separate / sort materials. Recycling can be an educational project. Segregate packaging for reuse. <p><u>Waste handling on site:</u></p> <ul style="list-style-type: none"> Separate / sort waste. Waste containers must have covers to prevent rainwater infiltration (domes / wheely bins). Ensure sufficient containers are available for storage of waste prior to removal off site to prevent overflow and littering on the site and surroundings. <p><u>Waste removal & disposal:</u></p> <ul style="list-style-type: none"> Municipality / contractor (Van der Westhuizen) will collect general waste from site for disposal to the local licensed municipal landfill / waste management facility in Rustenburg on a twice-a-week basis. No burning or burying of waste. Registered waste transporter will collect hazardous waste from site for disposal to a licensed hazardous waste management facility such as Holfontein or for recycling. <p><u>Documentation:</u></p> <ul style="list-style-type: none"> Ensure copies of all waste manifests (safe disposal certificates) are kept, showing responsible handling, transport and disposal by a reputable waste handler. Every worker must undertake good housekeeping practices.
<p>Air quality & Noise</p>	<p>Emissions may be released into the atmosphere from vehicle exhaust systems (carbon monoxide emissions, smoke).</p>	<ul style="list-style-type: none"> Busses will be used to transport scholars to reduce the number of vehicles and emissions. Busses will be maintained to comply with the old SABS 0181 standards (now SANS 10181:2003 in conjunction with SANS 10282:2003).

OPERATIONAL PHASE		
Aspect	Potential impact:	Management measures:
	Noise levels will increase due to the presence of people (conversations, sport events).	<ul style="list-style-type: none"> All noise complaints must be recorded (complaints register) and appropriately dealt with. Silencers must be used wherever necessary (generators etc). Ensure that the facilities abide by the RLM Noise by-laws, with regards to the abatement of noise caused by mechanical equipment, extraction fans, air conditioning and refrigerators. Comply with the provisions of SABS code of Practices 0103-1994 for the recommended sound and noise levels for different areas of occupancy and activities for residential and non-residential indoor spaces. For the protection of public health, the Environmental Protection Agency (EPA) proposed these levels: <ul style="list-style-type: none"> Neighbourhoods – During waking hours 55 dB Neighbourhoods – During sleeping hours 45 dB
	Insensitive illumination at night from area lighting or spot lighting on tall masts/poles at sports fields during sport events.	Lights to not face upwards (towards sky) & outwards (towards neighbours) but downwards and inwards (towards fields / structures) to reduce light spill beyond property boundary.
Water quality / quantity	Pollution of surface water runoff <ul style="list-style-type: none"> Accidental leaks / spills from STP. Incorrect and irresponsible storage and handling of hazardous substances. 	<ul style="list-style-type: none"> A storm water management plan should address this through the entire operational phase and include: <ul style="list-style-type: none"> 20% of storm water drains to the south to the stream. 80% of storm water drains to the north and will be captured in an attenuation pond. Surface drainage where possible (more natural). Sub-surface (underground) pipe system where surface drainage is not possible and buildings need to be protected. Erosion protection, stabilisation of erodible material and sediment control Retention (attenuation) where necessary (to slow flow velocities and release in a controlled manner) Emergency spill kits must be kept on site in an easily accessible area and employees should be trained in the event of a spill clean-up. A record of all spills and leaks must be kept (incident recording & reporting). An Emergency Response Plan to handle spills and leaks must be in place and followed. STP designed for 60m³/day though only 40.8m³/day sewage expected – adequate capacity to prevent overflows.

OPERATIONAL PHASE																									
Aspect	Potential impact:	Management measures:																							
	<p>Contamination of groundwater</p> <ul style="list-style-type: none"> Accidental leaks / spills from STP. Incorrect and irresponsible storage and handling of hazardous substances such as sewage sludge. 	<ul style="list-style-type: none"> Natural: Sand and silt on site have a minimal to medium capacity to absorb contaminants but medium to high capacity to create an effective barrier to the movement of contaminants (soil weather to clayey matrix with low permeability). Low risk due to medium to long distance to water table (10 to 15 metres surface to aquifer). Vulnerable to inorganic pollutants (nitrates, phosphates and chlorides) but with negligible risk of organic or microbiological contaminants (bacteria and viruses) due to 40-day period for breakdown. A high reduction of bacteria and viruses will be evident if a sewage leak does happen. Chlorinate the water from BH1 prior to human consumption due to the elevated (2 counts/100ml) faecal coliforms detected in the borehole water. Monitor BH1, 2 & 3 biannually for chemical and bacteriological parameters as set out in the monitoring programme (Section 10.6). The relevant authorities (NW DEDECT & DWS) must be kept informed of spills and contingency plans must be in place to minimise pollution should a spill occur (incident recording and reporting). Contamination clearing specialists for the area must be identified and their details available at all times. Hydrocarbon spill clean-up kits should be readily available throughout the site with staff trained in procedure. 																							
	<p>Groundwater availability</p> <ul style="list-style-type: none"> Impact on regional groundwater levels (groundwater level dropping). Impact on other groundwater users 	<ul style="list-style-type: none"> Equip BH3. Pump and back-up generator. Abstract (pump) and use water from the three (3) water supply boreholes on the property (west of R24) – BH1, 2 & 3. Equip the boreholes (BH1, 2 & 3) with flow meters to monitor the water quantity abstracted and to prevent over abstraction Abstract and use water at or below the recommended rates: <table border="1"> <thead> <tr> <th rowspan="2">Borehole</th> <th colspan="2">Recommended abstraction rate:</th> <th rowspan="2">Dynamic water level:</th> </tr> <tr> <th>12hours/day</th> <th>m³/day</th> </tr> </thead> <tbody> <tr> <td>BH1</td> <td>0.5</td> <td>21.6</td> <td>±40</td> </tr> <tr> <td>BH2</td> <td>0.6</td> <td>25.9</td> <td>±16</td> </tr> <tr> <td>BH3</td> <td>0.2</td> <td>8.6</td> <td>±12</td> </tr> <tr> <td>TOTAL</td> <td></td> <td>56.1</td> <td></td> </tr> </tbody> </table>		Borehole	Recommended abstraction rate:		Dynamic water level:	12hours/day	m ³ /day	BH1	0.5	21.6	±40	BH2	0.6	25.9	±16	BH3	0.2	8.6	±12	TOTAL		56.1	
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BH3	0.2	8.6	±12																						
TOTAL		56.1																							

OPERATIONAL PHASE		
Aspect	Potential impact:	Management measures:
	<p>Storm water management</p> <ul style="list-style-type: none"> Impermeable surfaces (such as roofed buildings, concrete surfaces, parking and roads) minimise the surface area available for water infiltration and prevents the effective infiltration of precipitation into the soils and therefore leads to an increase in surface water flow volumes to be managed as well as the velocity at which it flows. Pollution of storm water runoff. Flooding or ponding of storm water due to poor or improper drainage. 	<ul style="list-style-type: none"> The cost of storm water implementation, management and maintenance, as well as flood risk, can be greatly reduced by identifying, retaining and enhancing the natural areas along which runoff flows. The storm water management plan to consider Sustainable Urban Drainage Systems (SUDS). Rainwater harvesting should be considered to capture runoff from roofs and use of this water for irrigation in landscaped / garden / sports fields areas. Passing water from gutters onto grassed surfaces, rather than directly into areas prone to erosion or concrete areas. Clean water (majority of area) and dirty water (wastewater / sewage area) systems must be separated. Clean storm water from the surrounding area must be directed away and around the STP to replenish the water resources Spillages must be reported to the relevant authority and cleaned immediately. Technologies are available for recycling that can be considered by the applicant, including recycling of grey water and storm water capture and use for irrigation.
<u>Socio-economic</u>	<p>Health and safety</p> <ul style="list-style-type: none"> Injury and health impacts. 	<ul style="list-style-type: none"> Fire fighting equipment (fire extinguishers and fire hoses) must be visible (with signboards) and easily accessible (unobstructed) at all times. Ensure emergency water supply storage (120m³ reservoir). An emergency assembly point must be established and be clearly visible (signboard). Staff and scholars must be aware of and appropriately trained on the emergency response plan. A comprehensive Emergency Plan must be compiled to include the following details: Regular monitoring of all filters, extraction fans, refrigeration compressors and air conditioning units must take place to ensure acceptable working conditions. All mandatory fire equipment to be present on site and regularly inspected. <ul style="list-style-type: none"> Are all fire extinguishers present in their correct locations? Are all fire extinguishers hung or stand-mounted? Do all fire extinguishers with pressure gauges show correct pressure? Are all extinguishers free from signs of corrosion (incl. tap-test)? Are all extinguishers within their annual inspection date? Are all extinguishers un-obscured, unobstructed and freely visible? Ensure that staff is familiar with the OHSA and Policy. All the necessary safety regulations must be abided by including fire practice requirements. Inform staff about environmental and safety risks. Have documented work procedures. Ensure a vehicle is always available to transport an injured person to the emergency facilities at the nearby hospital in Rustenburg (see emergency numbers below in Table 10.3). Notices setting out the emergency procedures shall be prominently displayed. Signs will be placed (dimensions of at least 300mm by 300mm). <ul style="list-style-type: none"> Symbolic safety signs to indicate the locations of a fire extinguisher or a fire hose.

OPERATIONAL PHASE		
Aspect	Potential impact:	Management measures:
		<ul style="list-style-type: none"> ○ Signs must be permanent. ○ Do not position too many signs in one place. ○ Signs must be maintained and clearly visible.
	<p>Traffic</p> <ul style="list-style-type: none"> ● Traffic flow may be affected due to transportation of scholars. ● 240 trips in and out in the morning (6:30 – 7:30) and 105 trips in and out midday (14:00 – 15:00) – EPS, 2019 ● Standard passenger vehicles, single unit trucks & heavy vehicles for deliveries, waste removal, emergency vehicles, busses etc. ● 	<ul style="list-style-type: none"> ● School designed as boarding school and therefore trips are lower than that of a traditional school. ● After school activities such as sport events are usually attended by bus. ● Traffic counts include existing trips to school (350 scholars will just be relocated) and will therefore not be generated for a second time (trip volumes represent worst case scenario). ● Access to the school will be in the morning (6:30 – 7:30) when most residents leave Olifantsnek to go to Rustenburg area for work. ● Midday school traffic (14:00 – 15:00) will be during a quiet traffic time for the residential area. ● R24: <ul style="list-style-type: none"> ○ Main access road to Rustenburg with upgrades on-going (more planned). ○ Current configuration is capable of handling the expected traffic demand - all lanes on R24 maintain level of service (EPS, 2019). ○ Upgrade to dual carriageway road in future (SANRAL cost). ● R24 / Third Avenue intersection: <ul style="list-style-type: none"> ○ Remain unchanged for now. ○ With upgrade of R24 to dual carriageway, this intersection will probably be upgraded to a signalised intersection (EPS, 2019). ○ Scenario 3 (2025 with latent rights) – R24 / Third Avenue intersection was analysed as a signalised intersection (EPS, 2019). ● Third Avenue (Class 4b road) service entry: <ul style="list-style-type: none"> ○ Existing access road that will be used which also provides access to Olifantsnek area. ○ Busses and delivery vehicles will make use of the access at the circle prior to Third Avenue leading into the residential area (70m from R24), thereby minimising the impact on the residential area and its traffic. ○ Traffic circles have higher capacity than priority-controlled intersections and act as traffic management technique to reduce travel speeds (traffic calming). ○ Add an additional leg to existing 3 legged circle but existing dimensions and spacing remain unchanged (EPS, 2019). ● Third Avenue (Class 4b road) main entrance: <ul style="list-style-type: none"> ○ Replace T-junction with single lane traffic circle with 4 legs and outer circle diameter of 20m (as existing circle and within road reserve). ○ Traffic circles have higher capacity than priority-controlled intersections and act as traffic management technique to reduce travel speeds (traffic calming). ● Sight distance: 90m required for accesses along 60km/h speed limit roads – adequate. ● Proper traffic signals should be in place.

OPERATIONAL PHASE		
Aspect	Potential impact:	Management measures:
		<ul style="list-style-type: none"> • Pedestrians: 1.8m wide paved walkway with 0.6 - 2.5m buffer strips along Third Avenue parallel to property boundary. Access should also have a pedestrian walkway. • Parking & Drop-off facilities: <ul style="list-style-type: none"> ○ Location on site to avoid pedestrians being dropped off across the road with associated increase in pedestrian / vehicle conflict points. ○ Sufficient pick-up and drop-off facilities on site. ○ One-way single lane flow with left wheel facing kerb. ○ Temporary parking - refer to layout for parking space. ○ Exit without reversing ○ Not further than 150m from school building entrance. ○ Public transport facility separate from pick-up-drop-off facility. • Disable persons: Ramps at a slope of no more than 1:8. Pedestrian crossings with reduced level kerbs to allow use by disabled persons. • Parking: <ul style="list-style-type: none"> ○ One bay per classroom / office. ○ Additional parking to accommodate vehicles during school events. ○ One disabled parking bay / 200 normal parking bays. 2.5 X 3.5 m located as close as possible to building entrance. ○ 30m² require per parking bay

10.6 Monitoring programme

All records will be kept for at least five (5) years. All meters will be inspected annually, calibrated biennially and replaced or maintained every five (5) years as part of good housekeeping and preventative maintenance.

10.6.1 Construction Phase

The following aspects need to be monitored and audited:

a) Compliance with EMPr, environmental authorisation, WUL and any other licenses' conditions

- Appoint an Environmental Control Officer (ECO)

b) Noise, Nuisance and Disturbance Monitoring

- A record of complaints must be kept on the premises as well as the measures taken to address these complaints.

c) OHSa Compliance

- Register to indicate that all the employees and contractors have been informed as to their rights under the Act; and
- Accident records as per the Act - reported to the Department of Trade and Industry (DTI) and the Department of Labour (DOL).

10.6.2 Operational Phase

The following aspects need to be monitored and audited by principal during operation:

a) OHSa Compliance

- Register to indicate that all the employees (teachers and administrative staff) have been informed as to their rights under the Act; and
- Accident records as per the Act - reported to the DTI and DOL.

b) Complaints and incident register

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

c) Water monitoring – borehole as water supply source and STP effluent to confirm adequate treatment for reuse for irrigation purposes.

- Monitoring points: Three (3) production boreholes on the property (BH1, 2 & 3) and STP effluent.
- Frequency: Bi-annual (wet and dry season)
- Water quantity: Measure water levels in borehole and effluent volume from STP monthly.
- Water quality: To meet baseline (prior to school establishment) and drinking water standards (SABS 241) for borehole and irrigation and general limits for STP effluent
- Water quality parameters:
 - pH
 - Alkalinity (Alk)
 - Electrical Conductivity (EC)
 - Total Dissolved Solids (TDS)
 - Calcium (Ca)
 - Magnesium (Mg)

- Sodium (Na)
- Potassium (K)
- Free & saline Ammonia as N (NH₄-N)
- Sulphate (SO₄)
- Chloride (Cl)
- Nitrate as N (NO₃-N)
- Fluoride (F)
- ortho-Phosphate as P (o-PO₄)
- Bacteriological: E. coli and Total coliforms



Figure 10-1: Location of boreholes on the property (west of project area) and in relation to other boreholes (HK Geohydrological Services, 2019)

10.7 Record keeping and reporting

10.7.1 Compliance recording and reporting

Accurate and up-to-date records will be kept by the EO or other appointed representative of all system malfunctions resulting in non-compliance with the EMP, environmental authorisation and licenses (including WUL).

10.7.2 Incident recording and reporting

REC Establishers (Pty) Ltd will also, within 24 hours, ensure that the relevant authorities (RLM, NW DEDECT, DOL, DTI, Department of Education etc.) are notified of the occurrence or detection of any incident which has the potential to cause, or has caused pollution of the environment, health or safety risks or which is a contravention of any EMP, environmental authorisation or license condition. REC Establishers (Pty) Ltd is then to submit an action plan indicating measures, which will be taken to:

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

10.7.3 Complaints recording and reporting

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

10.8 Environmental awareness plan

10.8.1 Objectives

The objectives of an environmental awareness plan are to:

- Inform scholars, employees (teachers and administrative staff), contractors and visitors of any environmental risk which may result from their presence, work or activities, and
- Inform scholars, employees (teachers and administrative staff), contractors and visitors of the manner in which the identified possible risks must be dealt with in order to avoid pollution or degradation of the environment and health and safety hazards.

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

10.8.2 Communication

Both objectives of the environmental awareness plan indicate that scholars, employees (teachers and administrative staff), contractors and visitors must be informed of environmental matters. Information sharing is only possible through effective communication channels.

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

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

10.8.3 Communication responsibility

During the construction phase, the main contractor will be responsible for communication with sub-contractors and workers.

During the operational phase, the **management representative**, has the responsibility, designated authority and accountability to ensure:

- Communication channels/processes are established, implemented and maintained.
- External communication: Communication with the media (press releases), other governmental departments (Department of Labour, Department of Education etc.),

provincial (NW DEDECT) and local authorities (BPDM & RLM), as well as Interested and Affected Parties (I&APs) such as the surrounding community (OCHOA) on environmental issues.

- Internal communication:
 - Informing employees as to who is their representative and designated management appointee.
 - Obtaining information relating to responses required and/or requested by external parties from on-site representatives.
- Amendments to or new legislation, amendments to or new company policies, amendments to or new procedures and protocols.
- Development and review of environmental policies and management of hazards/risks/impacts.

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

10.8.4 Environmental risk

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

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

10.8.5 General considerations

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

Personnel, staff, workers, employees and contractors on the project need to be equipped with the knowledge, skills and training to enable them to manage their task competently and safely without significant impact on their surrounding environment. The company will ensure that it appoints people qualified for the task, which is expected of them and/or provide in-house training to acceptable skill levels.

While management will ultimately be responsible and accountable, employees (teachers and administrative staff) and scholars will also be given responsibility and accountability to follow procedures and report to management on certain aspects.

Basic environmental knowledge, training and awareness is included in the education curriculum.

10.8.6 Aspects covered

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

The items have been structured to enable even uneducated visitors to comprehend it. Pictures will be added to convey the message to illiterate people. Notices and signage will be placed around the site to continually remind workers and scholars to be environmentally responsible and cautious when entering premises.

General

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

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

Terminology

- Any change to the environment due to human activities is called an impact. Impacts can be positive or negative. A positive impact is the establishment of educational facilities. A negative impact is pollution such as littering and improper waste handling.
- Contamination or pollution is when a natural element such as air or water is impacted negatively due to human activities. Ablution outside dedicated facilities and littering impacts negatively on the environment..
- Environmental management is the control of human activities to minimise the impact on the natural environment as much as possible. It ensures that pollution is minimised and that people living in the environment are healthy (physically and mentally). Managing and treating sewage in a treatment plant to a level where the water can be reused is a management measure.

The role of the employee (teachers and administrative staff) and scholars.

- What can you and I do to protect the environment? Discuss environmentally acceptable behaviour such as closing of taps for water conservation, correct use of ablution facilities etc.
- What can you and I do to ensure that this project does not cause unnecessary damage to the environment? Stay within demarcated areas and use facilities for its intended purposes etc.
- There is always a reason for an environmental impact or accident and generally people are the reason.
- Always work and act carefully so that you don't damage the environment and protect your own safety and health.
- Obey the rules.

- Report any impacts/incidents or accidents to your teacher/supervisor/manager/principal.
- Your role is important, be environmentally responsible and always aware of the environment.
- Negative environmental impacts can cause death, injury, pain, suffering, diseases, damage to property and equipment, legal liability, cost, loss of productivity.
- We must look after our environment for the sake of our children and their children.

South African laws protecting the environment:

- Constitution of the Republic of South Africa, 1996 (Act 108 of 1996)
- National Water Act, 1998 (Act 36 of 1998)
- National Environmental Management Act, 1998 (Act 107 of 1998)
- National Environmental Management: Biodiversity Act (NEMBA), 2004 (Act 10 of 2004)
- National Environmental Management Air Quality Act, 2004 (Act 39 of 2004)
- National Environmental Management Waste Act, 2008 (Act 59 of 2008)
- National Heritage Resources Act, 1999 (Act 25 of 1999)

Animals

The following is important:

- No hunting, poaching, snaring, scaring, teasing, poisoning, torturing or killing of any animals will be allowed.
- Report animals seen within the area immediately to your teacher/supervisor/manager/principal to have them safely removed as this poses a danger to them.
- A qualified responsible contractor / Zoologist / Animal Behavioural Specialist / Professional Animal Handler / Organisation must be used to safely and responsibly handle all issues with regards to animals. This will include the safe capture, rehabilitation (if necessary) and the responsible relocation of such animals.
- If there is an infestation of an animal on site, it will be dealt with using best practice and following consultation from local registered animal organisations.
- Environmentally safe pest control should be implemented when necessary to prevent secondary impacts (for example consumption of poisoned rats by other animals).
- Cruelty to animals is a criminal offence.
- Make staff aware of the importance of the Giant Bullfrog.

Plants

The following is important:

- Vegetation will only be removed within the demarcated footprint of the project area (east of the R24), except for weeds and exotic vegetation, which should be cleared and controlled across the property.

Sewage and ablution

- No ablution or washing outside designated areas. Allowed for full flush toilets.

Waste Management

The following aspects are relevant to waste management:

- No littering is allowed on the property or neighbouring properties. A litter patrol will be conducted once a week to remove litter from the environment and properly dispose of this.

- It is advised that recycling bins be available on site for the duration of the operational phase.
- No waste is to be buried on this site or neighbouring properties.
- No burning of waste.
- Use skips/bins for general waste storage until it is collected for disposal.
- Hydrocarbon contaminated waste is considered hazardous and should be collected separately for recycling.
- Waste manifests or safe disposal certificates need to be obtained for all waste streams leaving the site (sewage sludge and solid waste) to ensure proper recycling or safe disposal.
- A spill kit will be kept in an accessible area on site at all times.

Water

In terms of water usage, the following:

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

Sensitive environments

The following is important:

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

Safety

- Keep on designated pathways and out of high vehicle traffic areas.
- Report fires, incidents, accidents, injuries etc.
- Understand where the emergency assembly point is.
- Functioning fire extinguishers (checked at regular intervals) should be available on site at all times.
- Follow emergency procedures to avoid injury.

Recording and Reporting

- All complaints by members of the public should be registered and captured in a complaints register;
- All incidents should be recorded in an incident log sheet to allow investigation and remedial action;
- Report impacts / incidents / accidents immediately to a teacher / supervisor / manager / principal;
- Investigate any impact / incident / accident to find out why it happened, what can be done to fix it and what should be done to prevent it from happening again; and
- Report any damage to infrastructure to a teacher / supervisor / manager / principal.

Recording and Reporting of Incidents / Accidents / Impacts

The second objective of the environmental awareness plan is to inform employees (teachers and administrative staff), contractors, scholars and visitors of the manner in which the identified possible risks must be dealt with in order to prevent degradation of the environment. Dealing with identified possible risks will include recording and reporting of incidents / accidents / impacts in order to allow investigation and remedial action.

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

The investigation report will contain the following information:

- Particulars and description of incident / accident / impact;
- The investigation panel;
- Root cause;
- Corrective and preventative measures to prevent recurrence;
- Witness and Insured's statements;
- Photos and Work Instructions; and
- Risk assessments carried out for the tasks performed.

Emergency and Contingency Measures

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

Table 10.2: Emergency contact details

NETCARE	082 911
POLICE	10111
POLICE STATION (Rustenburg)	014 590 4115
FIRE/AMBULANCE	10177
FIRE STATION (Rustenburg)	014 590 3444
HOSPITAL (Rustenburg Provincial Hospital in Rustenburg CBD)	014 590 5400
Animal Handler	083 410 7962
“Wild for Life” Rehabilitation Centre	014 592 6007

Table 10.3: Example of Incident and Environmental Reporting Sheet

INCIDENT AND ENVIRONMENTAL LOG SHEET															
Date:	2	0		/	m	m	/	d	d	Time:		:		Location:	
Nature of incident or risk type:	Procedure/ Process			Environmental			Safety			Health			Equipment/ Machinery	Other	
Description / nature	Quantity of Spill/ Release:									Pollutant/ Substance:					
Clean up or containment method:							Product Used:								
Hours lost:				Cost:						Root Cause:					
Corrective actions taken:															
Incident reported by:								Signature:							
Capacity of person above:								Repeat Incident				YES	NO		
Further investigation required:		YES	NO	Person handling further investigation:											

11 CONCLUSIONS & RECOMMENDATIONS

11.1 EAP Opinion

It is the opinion of the EAP that the project may continue based on the following:

- Land use
 - The property is not fully utilised for agricultural purposes as per its zoning.
 - The property is under-utilised.
 - ±40% of the property is still available for agricultural use (west of R24).
 - The RLM SDF indicates the project area (portion of property east of the R24) as planned for residential development (loss of agricultural potential a given). Residential development on the ±15ha would put significant strain on the natural water resources since the area has no formal municipal water supply and sewage management.
 - The project area is located east of and along the R24 (accessibility – main road between Johannesburg and Rustenburg) and west of the Olifantsnek residential area (already disturbed area).

- Biophysical environment:
 - Soil: Soil conditions are suitable for the planned development. Not necessary for SANS 634:2012, follow SAICE 2010 code of practice.
 - Palaeontology: Due to contact thermal metamorphosis caused by the intrusion of Diabase and Bushveld Igneous Complex rocks into the Transvaal Supergroup, the chances of finding intact fossils of bacteria and microbial mats in these sedimentary rocks are very small.
 - Cultural Heritage: No sites of heritage significance were found. Sites 1 (iron age / historical stone packed circle) & 3 (iron age / historical stone walling) have low cultural significance and the description in the specialist report is seen as sufficient. Site 2 (stone monolith) is of medium cultural significance and should therefore be included in the heritage register. A permit application is required to remove the stone but it is not planned to remove it.
 - Flora: No protected plant species or SCC were found within the project area during the site visit. The project area has a moderate sensitivity due to the remains of Secondary Bushveld but is disturbed. Survey was, however, done during the winter (July) and therefore another scan will be required during the wet season to ascertain no SCC.
 - Avifauna: The site is located within the IBA but due to the size of the IBA and the project area habitat, none of the species have a high likelihood to occur. No avifauna SCC were noted during the site visit.
 - Other fauna: No fauna SCC were noted during the site visit.
 - Sensitivity: The project area is however, indicated as a CBA2, ESA1 and in the buffer of the Magaliesberg Biosphere.
 - Groundwater quality in terms of use: The chemical groundwater quality is acceptable for potable use. Faecal coliforms were detected in BH1 and it therefore requires chlorination prior to use. BH2 and 3 have no bacteriological contamination and is suitable for use without treatment.
 - Groundwater quality in terms risk: Sand and silt on site have a minimal to medium capacity to absorb contaminants but medium to high capacity to create an effective barrier to the movement of contaminants (soil weather to clayey matrix with low permeability). Low risk due to medium to long distance to water table (10 to 15 metres surface to aquifer). Vulnerable to inorganic pollutants (nitrates, phosphates and chlorides) but with negligible risk of organic or microbiological contaminants (bacteria and viruses) due to 40-day period for breakdown.
 - Groundwater quantity /availability: The geohydrological investigation indicated the required water volumes to be available and attainable from the three (3) boreholes (BH1, 2 & 3) on the property. The quantities abstracted and used should be carefully controlled and restricted

to prevent impacts on borehole of Portion 56.

- Socio-economic:
 - The proposed project will create jobs in an area and country with a high unemployment rate.
 - The proposed project will contribute to the economy of the area (capital investment).
 - The proposed project addresses the need for basic education, which is a high priority in South Africa.

11.2 Conditions

The project can be authorised under the following conditions:

- Establishment of a package STP to not further place pressure on the natural water resources in terms of potential groundwater quality impacts (septic tanks and French drains are used in the area by residents).
- Abstraction and use of groundwater at recommended rates or below to prevent impacts on other groundwater users. Boreholes on Portion 62 (proposed new school) and Portion 56 (Mr Graham - irrigation) are within each other's zone of influence and therefore overabstraction from one portion will affect the availability of water in the other portion's borehole/s. The land owners therefore have to communicate and ensure no overabstraction takes place by either in order to prevent impacts on each other's groundwater use.
- Rehabilitation of areas disturbed, with indigenous vegetation. Improvement in portion to the west of the R24 to off set natural habitat lost to the east.
- Alien invasive eradication programme.
- Implement waste management in terms of the waste management hierarchy with prevention, minimisation, separation and recycling prior to disposal off-site.
- Implement energy efficient measures.
- Environmental awareness and acceptable conduct training for scholars.
- Chlorination of BH1 water prior to use (human consumption).
- Monitoring of groundwater quality (suitable for use) and quantity (abstraction) as well as reporting.
- Construct traffic circle at main entrance (4 legs) on Third Avenue; add additional leg to existing circle on Third Avenue (service entrance); construct pedestrian walkways along Third Avenue.
- Compliance with EMPr.

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