mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

SCOPING REPORT

FOR LISTED ACTIVITIES ASSOCIATED WITH MINING RIGHT AND/OR BULK SAMPLING ACTIVITIES INCLUDING TRENCHING IN CASES OF ALLUVIAL DIAMOND MINING

SUBMITTED FOR ENVIRONMENTAL AUTHORIZATIONS IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 AND THE NATIONAL ENVIRONMENTAL MANAGEMENT WASTE ACT, 2008 IN RESPECT OF LISTED ACTIVITIES THAT HAVE BEEN TRIGGERED BY APPLICATIONS IN TERMS OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002 (MPRDA) (AS AMENDED)

NAME OF APPLICANT: **Renaissance Resources (Pty) Ltd**
TEL NO: **082 960 9428 (Abraham)**
CEL NO: **082 371 8731 (Juan)**
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FILE REFERENCE NUMBER SAMRAD: **(NC) 30/5/1/3/2/10202 MR**

IMPORTANT NOTICE

In terms of the Mineral and Petroleum Resources Development Act (Act 28 of 2002 as amended), the Minister must grant a prospecting or mining right if among others the mining "will not result in unacceptable pollution, ecological degradation or damage to the environment".

Unless an Environmental Authorisation can be granted following the evaluation of an Environmental Impact Assessment and an Environmental Management Programme report in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA), it cannot be concluded that the said activities will not result in unacceptable pollution, ecological degradation or damage to the environment.

In terms of section 16(3)(b) of the EIA Regulations, 2014, any report submitted as part of an application must be prepared in a format that may be determined by the Competent Authority and in terms of section 17 (1)(c) the competent Authority must check whether the application has taken into account any minimum requirements applicable or instructions or guidance provided by the competent authority to the submission of applications.

It is therefore an instruction that the prescribed reports required in respect of applications for an environmental authorisation for listed activities triggered by an application for a right or a permit are submitted in the exact format of, and provide all the information required in terms of, this template. Furthermore please be advised that failure to submit the information required in the format provided in this template will be regarded as a failure to meet the requirements of the Regulation and will lead to the Environmental Authorisation being refused.

It is therefore an instruction that the Environmental Assessment Practitioner must process and interpret his/her research and analysis and use the findings thereof to compile the information required herein. (Unprocessed supporting information may be attached as appendices). The EAP must ensure that the information required is placed correctly in the relevant sections of the Report, in the order, and under the provided headings as set out below, and ensure that the report is not cluttered with un-interpreted information and that it unambiguously represents the interpretation of the applicant.

OBJECTIVE OF THE SCOPING PROCESS

The objective of the scoping report is to, through a consultative process—

(a) identify the relevant policies and legislation relevant to the activity;
(b) motivate the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;
(c) identify and confirm the preferred activity and technology alternative through an impact and risk assessment and ranking process;
(d) identify and confirm the preferred site, through a detailed site selection process, which includes an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified alternatives focusing on the geographical, physical, biological, social, economic, and cultural aspects of the environment;
(e) identify the key issues to be addressed in the assessment phase;
(f) agree on the level of assessment to be undertaken, including the methodology to be applied, the expertise required as well as the extent of further consultation to be undertaken to determine the impacts and risks the activity will impose on the preferred site through the life of the activity, including the nature, significance, consequence, extent, duration and probability of the impacts to inform the location of the development footprint within the preferred site; and
(g) identify suitable measures to avoid, manage, or mitigate identified impacts and to determine the extent of the residual risks that need to be managed and monitored.

PART A

SCOPE OF ASSESSMENT AND ENVIRONMENTAL IMPACT ASSESSMENT REPORT

2) Contact Person and Correspondence Address

a) Details of:-

i) Details of the EAP who prepared the report:

Name of the Practitioner:	**ROELIEN OOSTHUIZEN**
Tel No.:	**084 208 9088**
Fax No.:	**086 510 7120**
E-mail address:	roosthuizen950@gmail.com
Physical Address:	**Farm Oberon; Kimberley; 8301**
Postal Address:	**P.O. Box 110823, Hadisonpark; 8306**

ii) Appointed by:

Renaissance Resources (Pty) Ltd

iii) Expertise of the EAP

(1) The qualifications of the EAP

Masters in Environmental Management (UFS)
B-Comm in Human and Industrial- Psychology (NWU)
(with evidence attached as **Appendix 1**)

(2) Summary of the EAP's past experience

(In carrying out the Environmental Impact Assessment Procedure)

Relevant past experiences in carrying out the Environmental Impact Assessment Procedures include Environmental Impact Assessments, Environmental Management Plans/Programmes/ Reports, Performance assessments, Rehabilitation progress assessments, Environmental Liability assessments, Environmental compliance monitoring, Scoping Reports, etc.
See attached CV. (with evidence attached as **Appendix 2**)

b) Description of the property

Farm Name:	**Portion 15 and Portion 23 of the farm Lanyon Vale no 376.** District: Hay Province: Northern Cape Extent: 4 346.5033 ha
Application area (Ha)	4346.5033 ha (Four thousand three hundred and fourty six comma five zero three three hectares.)
Magisterial district:	Hay
Distance and direction from nearest town	The application area is situated between three towns near Niekerkshoop (west south-west). The town Prieska is situated 91.7 km south south-west of the application area. Furthermore, the towns Griequatown and Douglas is situated 83.5 km north north east and 67.3 km east north-east from the proposed mine area respectively.
21 digit Surveyor General Code for each farm portion	**15/Lanyonvale 376** - C03100000000037600015 **23/Lanyonvale 376** - C03100000000037600023

c) Locality map

(show nearest town, scale not smaller than 1:250000)

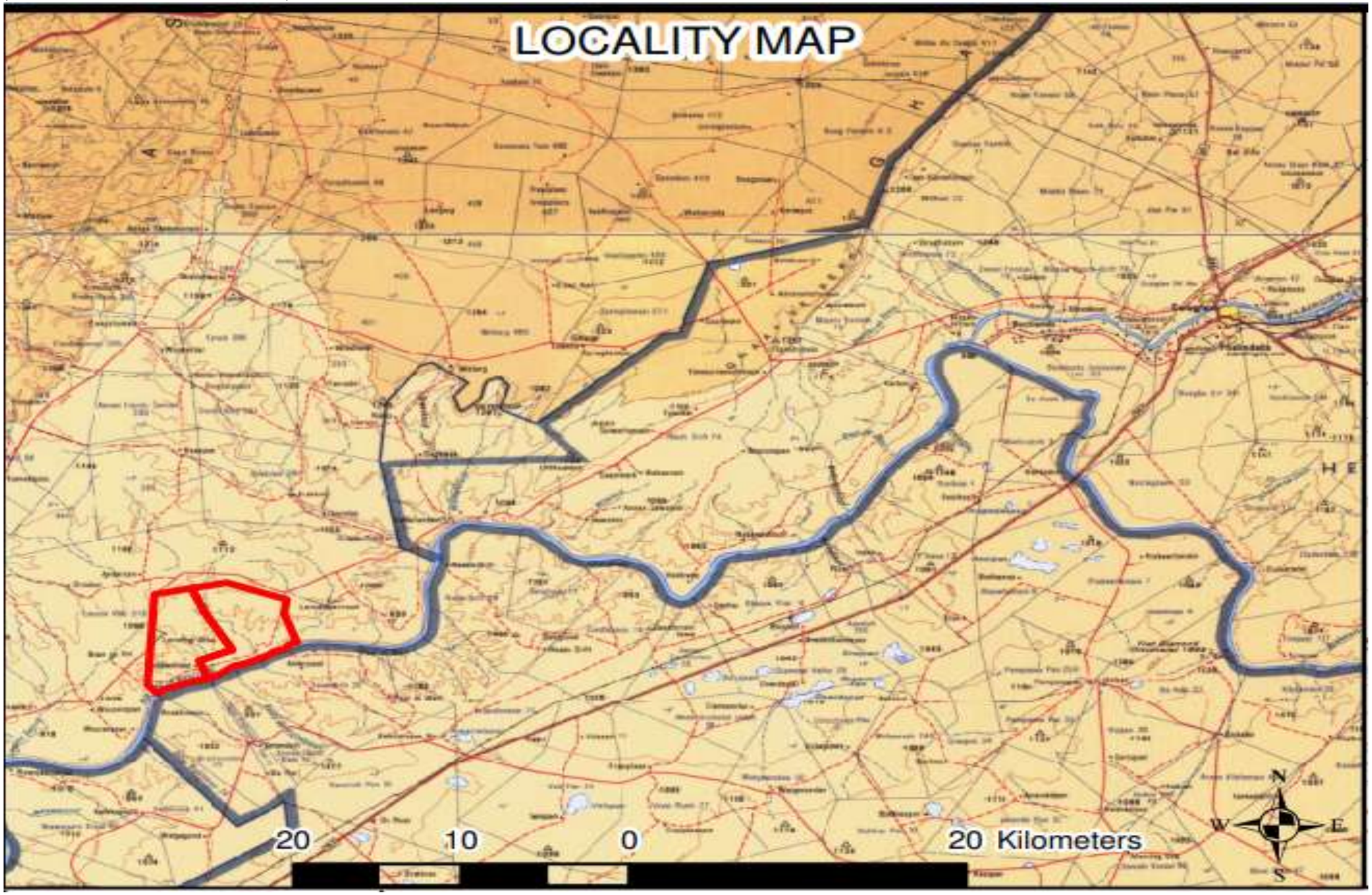

Figure 1. 1:250 000 topocadastral map KIMBERLEY 2824 indicating the application areas in red.

d) Description of the scope of the proposed overall activity

i) Listed and specified activities

(provide a plan drawn to a scale acceptable to the competent authority but not less that 1: 10 000 that shows the location, and area (hectares) of all the aforesaid main and listed activities, and infrastructure to be placed on site)

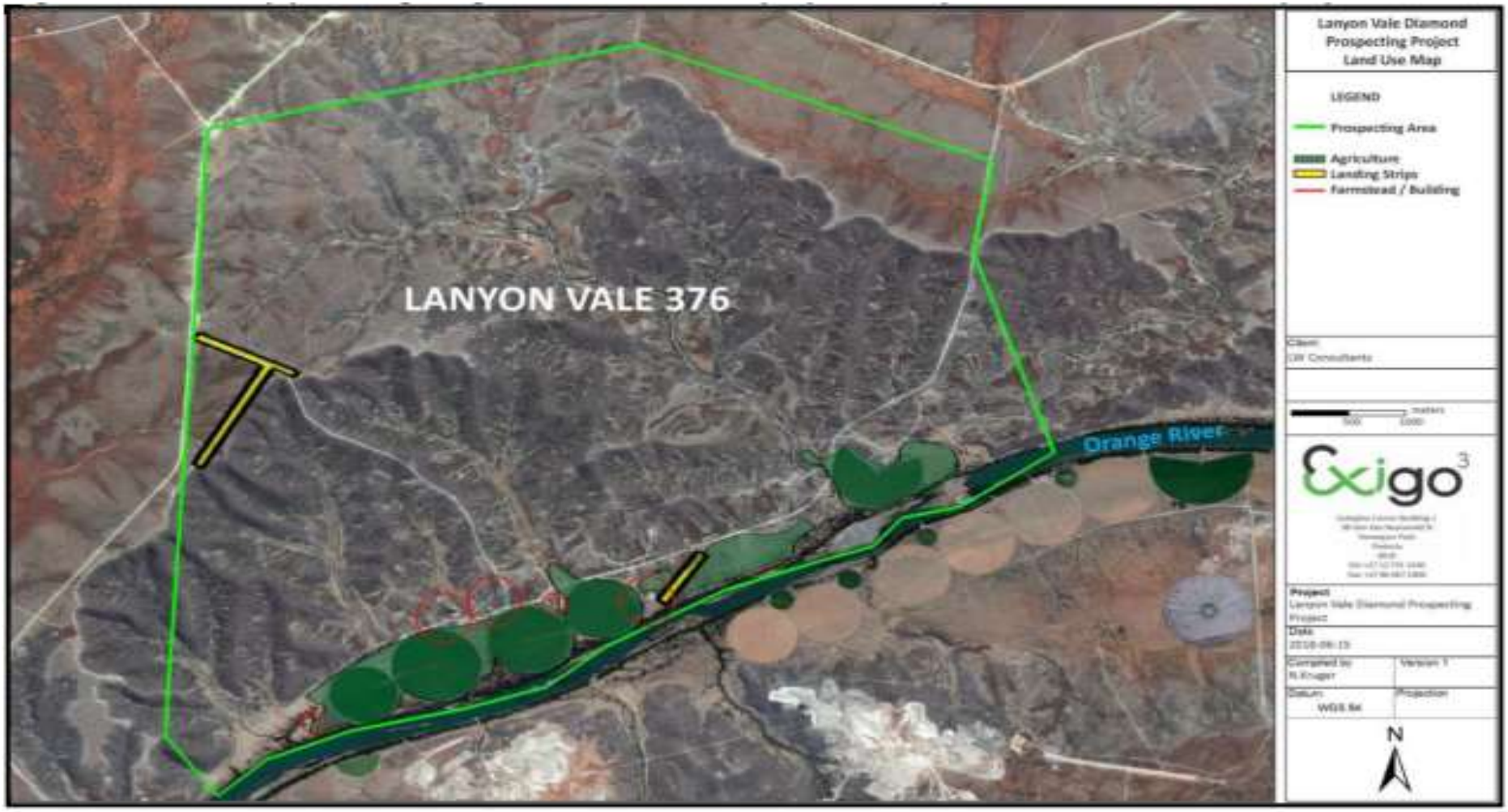

Figure 2. Location, and area (hectares) of all the aforesaid main and listed activities, and infrastructure to be placed in site. The red line indicates the areas that is the main target areas (Map done by Exigo).

Table 1. Listed and Specified Activities

Name of activity (e.g. Excavations, blasting, stockpiles, discard dumps or dams, loading, hauling and transport, water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)	Aerial extent of the activity (Ha or m²)	Listed Activity (mark with an X where applicable or affected)	Applicable Listing Notice (GNR544, GNR545 or GNR546 / Not listed GNR983, GNR984, GNR985/ Not listed)
Activity 9: "The development of infrastructure exceeding 1000 metres in length for the bulk transportation of water or storm water- (vii) with an internal diameter of 0.36 metres or more; or (viii) with a peak throughput of 120 litres per second or more;	Water distribution Pipelines	X	NEMA: LN1 (GNR327)
Activity 12: "The development of— The development of- (i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres; or (ii) infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs— (a) within a watercourse; (b) in front of a development setback; or **(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse"** Regulation GN R704, published on 4 June 1999 in terms of the National Water Act (Use of water for mining and related activities)	Clean and dirty water system It is anticipated that the operation will establish storm water control berms and trenches to separate clean and dirty water on the mining site.	X	NEMA: LN1 (GNR327)
Activity 13: The development of facilities or infrastructure for the off-stream storage of water, including dams and reservoirs, with a combined capacity of 50 000 cubic meters or more, unless such storage falls within the ambit of activity 16 in Listing Notice 2 of 2014	Possible storage dam and tanks	X	NEMA: LN1 (GNR327)

Activity 19: The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, **excavation, removal or moving** of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse;	Possible excavation within the 1:100-year flood line if approval is received from DWA	X	NEMA: LN1 (GNR327)
Activity 24: The development of a road- (ii) a road with a reserve wider than 13,5 meters or where no reserve exists where the road is wider than 8 metres.	Access and haul roads 10 000m²	X	NEMA: LN1 (GNR327)
Activity 17: Any activity including the operation of that activity which requires a **mining right** as contemplated in section 22 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including – (a) associated infrastructure, structures and earthworks, directly related to the extraction of a mineral resource; or (b) the primary processing of a mineral resource including winning, extraction, classifying, crushing, screening or washing; But excluding the secondary processing of a mineral resource, including the smelting, beneficiation, reduction, refining, calcining or gasification of the mineral resource in which case activity 6 in Listing notice 2 applies. The Renaissance operation directly relates to mining of a mineral resource (diamonds) and requires a mining right.	4 346.5033 ha	X	NEMA: LN2 (GNR325)
Activity 14: The development and related operation of facilities or infrastructure for the storage and handling of dangerous goods (fuel), where such storage occurs in containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic meters.	2 X 23 000l diesel tanks = 46 000l with capacity for storing of old oils and new oils to be calculated	X	NEMA: LN1 (GNR327)
Activity 15: The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for- (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.	±350 ha	X	NEMA: LN2 (GNR325)

Activity 12(g): 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. Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004; ii. Within critical biodiversity areas identified in bioregional plans;	Lanyon Vale falls into Critical Biodiversity Area 1 and 2 as well as Ecological Support	X	NEMA: LN3 (GNR 324)
Activity 11: The establishment or reclamation of a residue stockpile or residue deposit resulting from activities which require **a mining right**, exploration right or production right in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)	0.3ha The disposal of inert waste of 10 000 tons, excluding the disposal of such waste for the purposes of levelling and building which has been authorised by other legislation. The continuous establishment and reclamation of temporary stockpiles resulting from activities which require a mining right.		NEMWA: Category B (GNR 633)
Office complexes Temporary workshop facilities Storage facilities Concrete bund walls and diesel depots Ablution facilities Topsoil stockpiles Overburden stockpiles Water tanks	± 200 m2 ± 300 m2 ± 2 000 m2 ± 250 m2 ± 30 m2 ± 500 m2 5 000 m2 3m x 3m = 9m² each		Not Listed
Waste disposal site (domestic and industrial waste):	15m x 30m = 450m²		Not Listed

It is anticipated that the operation will establish a dedicated, fenced waste disposal site with a concrete floor and bund wall. The following types of waste will be disposed of in this area: • Small amounts of low-level hazardous waste in suitable receptacles. • Domestic waste. • Industrial waste.			

ii) Description of the activities to be undertaken

(Describe methodology or technology to be employed, including the type of commodity to be mined and for a linear activity, a description of the route of the activity)

Basic overview of the mining method

The following is a description of a typical South African alluvial diamond mining operation, which is also being utilized by Renaissance Resources (Pty) Ltd at the Lanyon Vale operation. The mining method being employed is a strip mining process with oversize material from the gravel scalping and the tailings from the plant, being used as backfill material prior to final rehabilitation.

Gravels are excavated, loaded onto a vibrating grizzley or scalping screen and the +32 mm oversize material is discarded back into the open pit (about 55% reduction). The screen will be moved adjacent to each pit. Once the pit is complete it will be moved to the next pit.

The remaining –32 mm fraction is , loaded and transported to the nearby treatment facility using articulated dump trucks.

Where pans are used the screened material is loaded into a series of 4 sixteen foot rotary pans, each typically with a treatment capacity of 80 tph. Tracer tests are done regularly to ensure that the pans are operating at the correct density. Concentrate is tapped continuously from each of the pans every three hours into three ton holding bins and transported with enclosed trucks to a final recovery unit or any other facility which is chosen by Renaissance Resources (Pty) Ltd.

Topsoil will be removed from the first block, where after it will be stored separately on the high ground of the proposed mining area. Stored topsoil will be kept separate from overburden and will not be used for the building or maintenance of access roads. Stored topsoil will be adequately protected from being eroded or blown away.

Exposed diamondiferous gravel of Block 1 will then be removed by means of an excavator and loaded onto a tipper truck or front end loader, which will transport it to the nearby first stage mineral processing plant at the edge of excavation due for backfilling. At this plant the diamondiferous gravel will be sorted by means of a grizzly screen grid or scalping screen and all material larger than 100 mm will be separated from the rest. This material will be used in the backfilling stage.

Screened material smaller than 100 mm will be transported to a stockpiling area at the treatment plant, via front-end loader or tipper. From here it will be transported to a conveyor belt, which will feed it onto a Findlay type screen or if wet, then to scrubber or wet rotary screen and then directly onto 2 X 16 feet washing pans per site.

The following procedure will be followed in terms of backfilling and rehabilitation:

- The coarse gravel sifted at the grizzly screen, tailing from the pans and fine concentrate will be transported back to and dumped into open Block 1. During

this process of backfilling, variation in the dumping sequence of different sized materials will be followed to ensure better compaction and stability of the reclaimed gravel. This will ensure that the voids surrounding the coarse gravel will be filled up with finer sediments. Compaction will be achieved through the movement of heavy vehicles over the area during the backfilling stage.

- The mining sequence will be followed until the last block is reached. Topsoil stored at the beginning of the mining operation will now be utilized for the final rehabilitation of the last block on the land portion.

Workshop equipment and tools to be used consist of secured container stores containing grease pumps, rigger chains, hydraulic jacks, air compressors, electric testers, welders, grinders, socket sets, gas sets, magnetic drills, hydraulic test instruments, tools, spanners and tool boxes Approximately 18 000 litres of process water will be required by the proposed mining operation per hour per pan however modern technology in de-sanding may reduce water consumption in some areas. The use of closed circuit water recovery systems on the pans can result in further savings of more than 50% on water requirement.

Process water is sourced from the Orange River for the Lanyon Vale operation. Other sources of water include pumping water from mining excavations or the tailings or slimes disposal facilities and recyling ponds. The production rate of the proposed operation will be approximately 80 tph per pan.

Waste Management

Proper sanitation facilities will be provided for employees. No person will pollute the workings with faeces or urine, misuse the facilities provided or inappropriately foul the surrounding environment with faeces or urine. Acceptable hygienic and aesthetic practices will be adhered to. Non-biodegradable refuse such as glass bottles, plastic bags, etc. will be sorted and stored in separate lockable containers at a central point. It will be disposed of at a recognised disposal facility twice a month. Biodegradable refuse will either be handled as indicated, or be buried in a pit excavated for that purpose and covered with layers of soil when almost full. A final 0,5m thick layer of topsoil will be incorporated where practicable. Provision will be made for the future subsidence of the covering. Refuse will not be dumped in the vicinity of the mining area. Waste material with regard to vehicle repairs will be kept in 200 litres steel containers in the maintenance/farmstead area. This material will be disposed of at a recognised disposal facility once a month.

Access Roads

Access to the area is via an all-weather well-maintained secondary dirt road between Douglas and Prieska running along the north-western bank of the Orange River.
The Activities associated with the Mine that is expected to make use of these roads include:-

- The transportation of mining personnel to and from the site;
- Delivery of supplies and materials;
- The transportation of the product for the market.

These transport operations will make use of passenger vehicles, light delivery vehicles and very limited heavy vehicles.

Haul Roads

There will be one Haul road to the plant area and one haul road to the mining site. No other haul roads will be constructed. Main haul roads will have a minimum width of 15m. No roads will be wider than 15m. Existing roads will be used as far as practically possible.

e) Policy and Legislative Context

Table 2. Applicable legislation and guidelines used to compile the report

Applicable Legislation and Guidelines used to compile the report (a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process.)	Reference where applied	HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE POLICY AND LEGISLATIVE CONTEXT (E.g In terms of the National Water Act:-Water Use License has/has not been applied for).
Conservation of Agricultural Resources Act (Act 43 of 1983) and Regulations (CARA)	- Section 5: Implementation of control measures for alien and invasive plant species; - Section 6: Control measures. - Regulation GN R1048, published on 25 May 1984, in terms of CARA	- Control measures are to be implemented upon the approval of the EMPR.
Constitution of South Africa (Act 108 of 1996)	- Section 24: Environmental right - Section 25: Rights in Property - Section 27: Water and sanitation right	- To be implemented upon the approval of the EMPR.
Environment Conservation Act (Act 73 of 1989) and Regulations (ECA)	- Sections 21, 22, 25, 26 and 28: EIA Regulations, including listed activities that still relate to the existing section of ECA. - Section 28A: Exemptions.	- To be implemented upon the approval of the EMPR.
Fencing Act (Act 31 of 1963)	- Section 17: States that any person erecting a boundary fence may clean any bush along the line of the fence up to 1.5m on each side thereof and remove any tree standing in the immediate line of the fence. However, this provision must be read in conjunction with the environmental legal provisions relevant to protection of flora.	- Control measures are to be implemented upon the approval of the EMPR.
Hazardous Substances Act (Act 15 of 1973) and Regulations read together with NEMA and NEMWA	- Definition, classification, use, operation, modification, disposal or dumping of hazardous substances.	- Noted and Considered measures are to be implemented upon the approval of the EMPR.

Intergovernmental Relations Act (Act 13 of 2005)	- This Act establishes a framework for the National, Provincial and Local Governments to promote and facilitate intergovernmental relations.	
Mine, Health and Safety Act (Act 29 of 1996) and Regulations	- Entire Act.	- Control measures are to be implemented upon the approval of the EMPR.
Mineral and Petroleum Resources Development Act (Act 28 of 2002) and Regulations as amended	- Entire Act. - Regulations GN R527	- A Mining Right has been applied for (NC) 30/5/1/2/2/10202MR. - Rights and obligations to be adhered to.
National Environmental Management Act (Act 107 of 1998) and Regulations as amended	- Section 2: Strategic environmental management principles, goals and objectives. - Section 24: Foundation for Environmental Management frameworks. - Section 24N: - Section 24O: - Section 28: The developer has a general duty to care for the environment and to institute such measures to demonstrate such care. - Regulations GN R547, more specifically Chapters 5 and 7, where applicable (the remainder was repealed) published on 18 June 2010 in terms of NEMA (Environmental Management Framework Regulations) - Regulations GN R982 to R985, published on 4 December 2014 in terms of NEMA (Listed Activities) - Regulations GN R993, published on 8 December 2014 in terms of NEMA (Appeal) - Regulations GN R994, published on 8 December 2014 in terms of NEMA (exemption) - Regulations GN R205, published on 12 March 2015 in terms of NEMA (National appeal Amendment Regulations)	- Control measures are to be implemented upon the approval of the EMPR.

	- Regulations GN R1147, published on 20 November 2015 in terms of NEMA (Financial Provision)	
National Environmental Management: Air Quality Act (Act 39 of 2004)	- Section 32: Control of dust - Section 34: Control of noise - Section 35: Control of offensive odours - Regulation GN R551, published on 12 June 2015 (amended Categories 1 to 5 of GN 983) in terms of NEM:AQA (Atmospheric emission which have a significant detrimental effect on the environment) - Regulation GN R283, published on 2 April 2015 in terms of NEM:AQA (National Atmospheric Emissions Reporting Regulations) (Group C-Mines)	- Control measures are to be implemented upon the approval of the EMPR. - This is also legislated by Mine Health and Safety from DMR and is to be adhered to.
National Environmental Management: Biodiversity Act (Act 10 of 2004)	- Section 52 of The National Environmental Management Act: Biodiversity Act (NEMBA) (Act 10 of 2004) states that the MEC/Minister is to list ecosystems that are threatened and in need of protection. - Section 53 states that the Minister may identify any process or activity in such a listed ecosystem as a threatening process. - A list of threatened and protected species has been published in terms of Section 56(1) GG 29657 GNR 151 and GNR 152, Threatened or Protected Species Regulations. Commencement of Threatened or Protected Species Regulations 2007 : 1 June 2007 GNR 150/GG 29657/23-02-2007	- A permit application regarding protected plant species need to be lodged with DENC if any protected species is encountered. Control measures are to be implemented upon the approval of the EMPR.

<table>
<tr>
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<td>Publication of lists of critically endangered, vulnerable and protected species GNR 151/GG 29657/23-02-2007 *

Threatened or Protected Species Regulations GNR 152/GG 296547/23-02-2007 *
- Sections 65 – 69: These sections deal with restricted activities involving alien species; restricted activities involving certain alien species totally prohibited; and duty of care relating to alien species.
- Sections 71 and 73: These sections deal with restricted activities involving listed invasive species and duty of care relating to listed invasive species.
- Regulation GN R151, published on 23 February 2007 (List fo Critically Endangered, Vulnerable and Protected Species, 2007) in terms of NEM: BA
- Regulation GN R152, published on 23 February 2007 (TOPS) in terms of NEM:BA
- Regulations GN R507 to 509 of 2013 and GN 599 of 2014 in terms of NEM:BA (Alien Species)</td>
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<td>The National Environmental Management Act: Protected Areas Act (NEMPAA) (Act 57 of 2003) provides for the protection of ecologically viable areas that are representative of South Africa"s natural biodiversity and its landscapes and seascapes.</td>
<td>- Chapter 2 lists all protected areas.</td>
<td>Applicable. The mining operation does fall within protected areas which is known.
Sensitivity Features:
<table><tr><th>Sensitivity</th><th>Feature(s)</th></tr><tr><td>Low</td><td>Low Sensitivity</td></tr><tr><td>Very High</td><td>Critical Biodiversity Area 1</td></tr><tr><td>Very High</td><td>Critical Biodiversity Area 2</td></tr><tr><td>Very High</td><td>Ecological Support Area</td></tr></table></td>
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		Layon Vale falls into Critical Biodiversity Area 1 and 2 as well as Ecological Support Areas and Ecological Support Areas in terms of the screening report.
National Environmental Management: Waste Management Act (Act 59 of 2008)	- Chapter 4: Waste management activities - Regulations GN R634 published on 23 August 2013 in terms of NEM:WA (Waste Classification and Management Regulations) - Regulations GN R921 published on 29 November 2013 in terms of NEM:WA (Categories A to C – Listed activities) - National Norms and Standards for the Remediation of contaminated Land and Soil Quality published on 2 May 2014 in terms of NEM:WA (Contaminated land regulations) - Regulations GN R634 published on 23 August 2013 in terms of NEM: WA (Waste Classification and Management Regulations) - Regulations GN R632 published on 24 July 2015 in terms of NEM: WA (Planning and Management of Mineral Residue Deposits and Mineral Residue Stockpiles) - Regulations GN R633 published on 24 July 2015 in terms of NEM: WA (Amendments to the waste management activities list published under GN921)	- To be implemented upon the approval of the EMPR.
National Forest Act (Act 84 of 1998) and Regulations	- Section 15: No person may cut, disturb, damage, destroy or remove any protected tree; or collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, except under a licence granted by the Minister.	- A permit application regarding protected tree species need to be lodged with DAFF if necessary. - Control measures are to be implemented upon the approval of the EMPR.
National Heritage Resources Act (Act 25 of 1999) and Regulations	- Section 34: No person may alter or demolish any structure or part of a structure which is older than	- Control measures are to be implemented upon the approval of

	60 years without a permit issued by the relevant provincial heritage resources authority. - Section 35: No person may, without a permit issued by the responsible heritage resources authority destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or paleontological site. - Section 36: No person may, without a permit issued by SAHRA or a provincial heritage resources authority destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a forma cemetery administered by a local authority. - Section 38: This section provides for HIA which are not already covered under the ECA. Where they are covered under the ECA the provincial heritage resources authorities must be notified of a proposed project and must be consulted during HIA process. - Regulation GN R548 published on 2 June 2000 in terms of NHRA	the EMPR. Fossil finds procedure are attached to the PIA.
National Water Act (Act 36 of 1998) and regulations as amended, *inter alia* Government Notice No. 704 of 1999	- Section 4: Use of water and licensing. - Section 19: Prevention and remedying the effects of pollution. - Section 20: Control of emergency incidents. - Section 21: Water uses In terms of Section 21 a licence is required for: (a) taking water from a water resource; (b) storing water; (c) impeding or diverting the flow of water in a watercourse; (f) Waste discharge related water use;	- A water use application (WULA) must be submitted and will be submitted to run concurrently with the Mining Right application. - Control measures are to be implemented upon the approval of the EMPR.

	(g) disposing of waste in a manner which may detrimentally impact on a water resource; (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; and; - Regulation GN R704, published on 4 June 1999 in terms of the National Water Act (Use of water for mining and related activities) - Regulation GN R1352, published on 12 November 1999 in terms of the National Water Act (Water use to be registered) - Regulation GN R139, published on 24 February 2012 in terms of the National Water Act (Safety of Dams) - Regulation GN R398, published on 26 March 2004 in terms of the National Water Act (Section 21 (j)) - Regulation GN R399, published on 26 March 2004 in terms of the National Water Act (Section 21 (a) and (b)) - Regulation GN R1198, published on 18 December 2009 in terms of the National Water Act (Section 21 (c) and (i) – rehabilitation of wetlands) - Regulations GN R1199, published on 18 December 2009 in terms of the National Water Act (Section 21 (c) and (i)) - Regulations GN R665, published on 6 September 2013 in terms of the National Water Act (Amended GN 398 and 399 – Section 21 (e), (f), (h), (g), (j))	
Nature Conservation Ordinance (Ord 19 of 1974)	- Chapters 2, 3, 4 and 6: Nature reserves, miscellaneous conservation measures, protection	- Control measures are to be implemented upon the approval of the EMPR.

	of wild animals other than fish, protection of Flora.	
Occupational Health and Safety Act (Act 85 of 1993) and Regulations	- Section 8: General duties of employers to their employees. - Section 9: General duties of employers and self-employed persons to persons other than their employees.	- Control measures are to be implemented upon the approval of the EMPR.
Road Traffic Act (Act 93 of 1997) and Regulations	- Entire Act.	- Control measures are to be implemented upon the approval of the EMPR.
Water Services Amendment Act (Act 30 of 2007)	- It serves to provide the right to basic water and sanitation to the citizens of South Africa (giving effect to section 27 of the Constitution).	- Control measures are to be implemented upon the approval of the EMPR.
National Land Transport Act, (Act 5 of 1998)		- To take note.
Spatial Planning and Land Use Management (Act 16 of 2013 (SPLUMA) and regulations	- To provide a framework for spatial planning and land use management in the Republic; - To specify the relationship between the spatial planning and the land use management, amongst others - Regulations GN R239 published on 23 March 2015 in terms of SPLUMA	- To be implemented upon the approval of the EMPR.
Subdivision of Agricultural Land Act, 70 of 1970 and regulations	- Regulations GN R373 published on 9 March 1979 in terms of Subdivision of Agricultural Land	- To take note.
Basic Conditions of Employment Act (Act 3 of 1997)) as amended	- To regulate employment aspects	- To be implemented upon the approval of the EMPR
Community Development (Act 3 of 1966)	- To promote community development	- To be implemented upon the approval of the EMPR
Development Facilitation (Act 67 of 1995) and regulations	- To provide for planning and development	- To take note.
Development Facilitation (GNR1, GG20775, 07/01/2000)	- Regulations re application rules S26, S46, S59	- To take note.

Development Facilitation (GN732, GG14765, 30/04/2004)	- Determines amount, see S7(b)(ii)	- To take note.
Land Survey Act (Act 8 of 1997)) and regulations, more specifically GN R1130	- To control land surveying, beacons etc. and the like; - Agriculture, land survey S10	- To take note.
National Veld and Forest Fire Act (Act 101 of 1998)) and regulations, more specifically GN R1775	- To regulate law on veld and forest fires - (Draft regulations s21)	- To be implemented upon approval of the EMPR

f) Need and desirability of the proposed activities

(Motivate the need and desirability of the proposed development including the need and desirability of the activity in the context of the preferred location)

The Renaissance Resources Project is in line with the 'Beneficiation Strategy for the Minerals Industry of South Africa' (DMR, 2011) in terms of aiming to beneficiate diamonds for sale/export. The benefits of this will fall directly to the Northern Cape Province and, specifically, the Siyancuma District.

In addition, the South African National Development Plan aims to eliminate poverty and reduce inequality by 2030. South Africa can realise these goals by drawing on the energies of its people, growing an inclusive economy, building capabilities, enhancing the capacity of the state, and promoting leadership and partnerships throughout society. The Renaissance Project will contribute to achieving this plan in terms of direct and indirect employment of people from the local and district municipalities as well as investment in the region and on a national scale.

Renaissance was granted a prospecting right by the DMR to prospect for alluvial diamonds on Portion 15 and Portion 23 of the farm Lanyon Vale no 376. in the District of Hay. The application area is situated between three towns near Niekerkshoop (west south-west). The town Prieska is situated 91.7 km south south-west of the application area. Furthermore, the towns Griequatown and Douglas is situated 83.5 km north north east and 67.3 km east north-east from the proposed mine area respectively.

In order to advance the project and to prove the presence of a minable resource of diamonds Renaissance undertook a in depth investigation mainly obtained through in-depth discussions with previous small-scale diggers and farmers and from consulting geologists who did work on the projects on the farms and a reserve was proven.

Diamond mining, will contribute to South Africa's status in world diamond production and Renaissance's vision is to be an active participant in the industry. Importantly it is a product that is exported and earns foreign exchange.

Should this proven reserve be mined, it would provide a significant contribution to the local community and the economy of the country.

Need

Analysis of the Diamond Industry – ALROSA(website)

The Information on the analysis of the diamond industry was obtained from the ALROSA website who is one of the biggest diamond producers in the world.

The world diamond market is represented by diamond mining and trade in rough diamonds. The bulk of the world diamond mining is concentrated in nine countries, with their share in the global production in physical terms as high as 99%.

The world's largest producers of natural diamonds are Russia, the Democratic Republic of Congo (DRC) and Botswana, all together accounting over 60% of the global diamond production.

Top Countries in the Global Diamond Production 2016: 134.1 mln. Carats

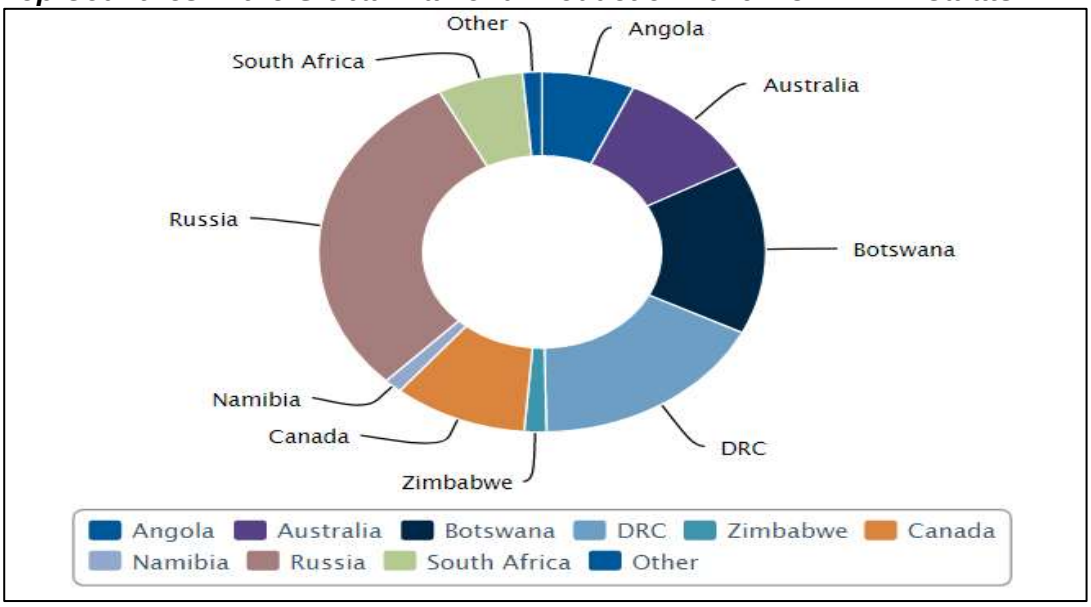


Figure 3. Kimberley Process companies' data Global Diamond Production 2011-16 (thousands of carats)

World diamond production based on the costs of produced rough diamonds are dominated by Russia, Botswana and Canada with a combined production of more than 60% of the total worldwide production

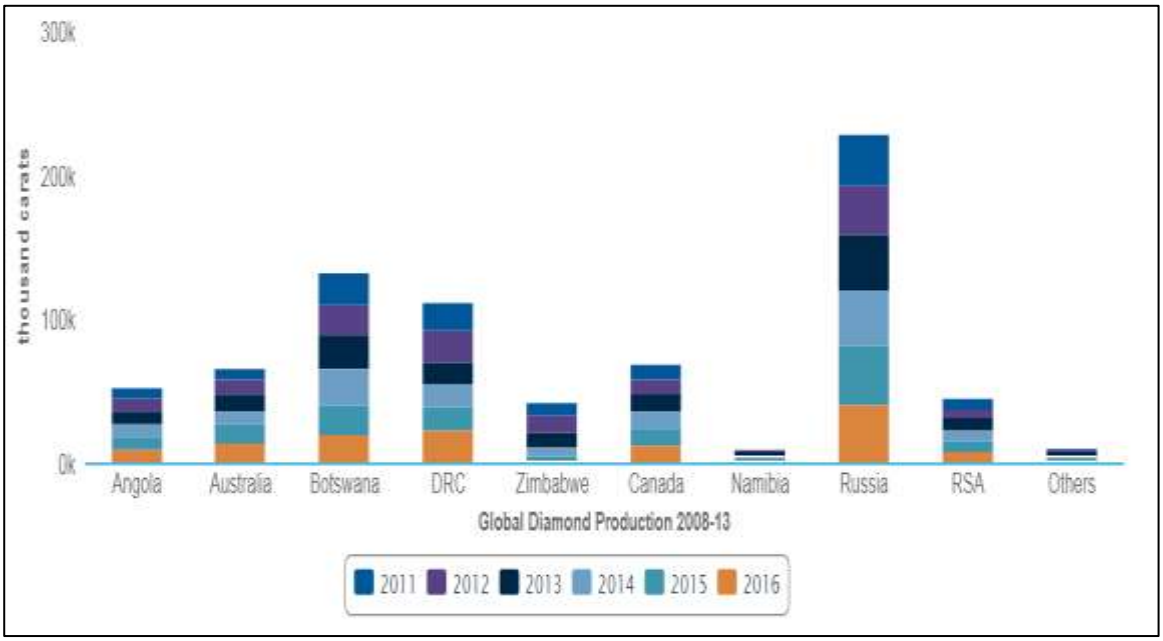


Figure 4. Global Diamond Production 2011-16 (thousands of carats) Kimberley Process companies' data

Russia ranks first in the world's diamond production. ALROSA Group accounts for 93% of the total diamond production in the Russian Federation in physical terms, and it is the leader of the global diamond mining industry. Major mining companies are engaged in mining in the main diamond-producing countries, the exception being Zimbabwe and the DRC, where diamond deposits are developed by small companies and prospectors. The graph below represents the geography of the companies' activities including exploration.

Diamond Production by Leading Companies, 2016(* - *including Ekati; Companies' data*)

The world's diamond mining is concentrated in the major primary deposits accounting for about 60% of the global diamond production. The remaining production is concentrated in placer deposits, the principal of them located in the DRC (Mbiji-Mayii) and Zimbabwe (Marange).

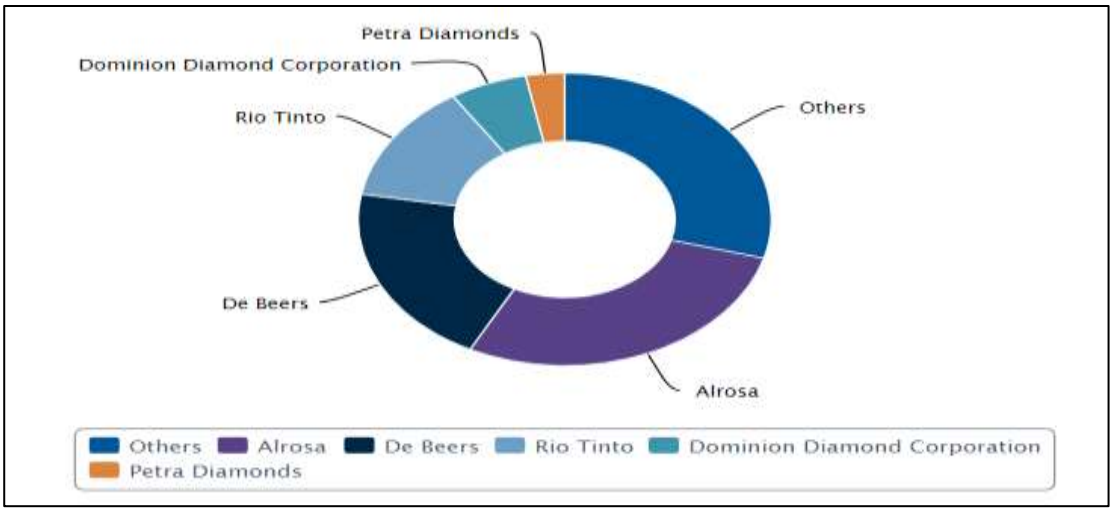


Figure 5. Diamond Production by Leading Companies, 2016(***** - including Ekati; Companies' data)

Figure 6. Production Output of the World's Major Diamond Deposits, 2016 (thousand carats) Kimberley Process and companies' data; ***** - Ekati includes open-pit and underground mining; ****** - output, including further development of the open-pit.

By their attributes diamonds from deposits fall into two categories: gem quality and industrial grade diamonds. The former is used in diamond jewellery production, while the latter is used for industrial purposes (manufacture of drills, saws, and abrasive powders). Gem quality rough diamonds are sorted by size, colour, quality and shape, and then are sold to buyers in conformity with the sales policy adopted in a rough diamond production company. Depending on the quality of the mined rough diamonds, the current state of the market, the adopted marketing policy, companies use different approaches to diamond sales: sights, tenders, auctions, spot transactions and long-term contracts.

The world's largest trading centres, which concentrate the bulk of trade in natural rough diamonds, are India, Belgium, the UAE, the USA, Hong Kong and Israel. Being sold from mines, natural rough diamonds arrive at cutting and polishing plants to become polished diamonds that will be used in jewellery making.

(The information above was sourced from the ALROSA website. ALROSA is a world leader in the world diamond mining industry, a Russian partially state-owned diamond mining company)

The Diamond Pipeline

The Diamond Pipeline can be defined as the route the diamond takes from mine to end consumer. The diamond pipeline, typically, comprises**.**

Figure 7. The Diamond Pipeline

Exploration/Prospecting; involves geologists finding diamond deposits in different areas. Prospecting is vital to the future survival of any diamond business as there is a predicted supply-demand gap.

Mining and Recovery; once diamonds have been discovered and surveys shown that it is financially viable to mine them; they are now recovered from the ground. The manner in which they are mined and recovered depends on their source, thus, where they are found.
Sorting and valuing; process of sorting and valuing of diamonds, categorizing them according to size, quality, model and colour.

Cutting and polishing; refers to manufacturing of diamonds; the process of turning rough diamonds into polished.

Polished Market; this is referred to as the 'diamond exchange bourse', a place where diamonds are traded. These are located in some of the world's major diamond manufacturing centres, e.g. Belgium.

Retailing; polished diamonds find their way to Jewellers and Consumers through Wholesalers and Retailers.

International Diamond Market Trends

Although global financial stability has proven quite volatile over the past 4-5 years, the diamond industry appears to have stabilised somewhat, with moderate increases in diamond prices forecast for the immediate future.

g) Period for which the environmental authorisation is required

The period applied for, being 10 years, based on the production of between 704 000 tons in year 1 ramped up in year 2 to an envisaged 1 408 000 tons per annum.

h) Description of the process followed to reach the proposed preferred site

NB!! – This section is not about the impact assessment itself; It is about the determination of the specific site layout having taken into consideration (1) the comparison of the originally proposed site plan, the comparison of that plan with the plan of environmental features and current land uses, the issues raised by interested and affected parties, and the consideration of alternatives to the initially proposed site layout as a result.

The location of the mine is determined by the geological location of the mineral resource.

- No trial mining has taken place at the Lanyon Vale project. Only 3 bulk samples were made on the project with an estimated amount of 29 970 ton excavated.
- Two bulk samples were excavated by Rockwell Diamonds on Terrace B at Wouterspan, located 200m southwest of Lanyon Vale on the same elevation as the projected terraces as found on Lanyon Vale.

(1) During 2016, a total of 94 380 ton of gravel was treated at terrace B to recover 585ct (72 stones) at an average grade of 0.62 cpht and stone size of 8.12ct/stone, which included the recovery of a number of large stones (76.83ct, 64.03ct, 45.08ct, 44.66ct, 29.21ct, 27.41ct and 26.98ct). Gravels were screened at an effective 8mm bottom cut-off, resulting in the higher average stone sizes than normal. During the period under review, 965.1ct (116 stones) were sold for an average of US$1,884/ct (Including terrace B and other areas on Wouterspan).

(2) During 2017, under the guidance of the CP, a total of 58 760 ton of fluvial- alluvial gravel was treated from terrace B, recovering a total of 235ct at an average grade of 0.4 cpht. Average selling price during this period was US$2,000/ct. All gravel derived from bulksamples on terrace B were processed through Rockwell's plant (on the Wouterspan property) to determine average sample grade.

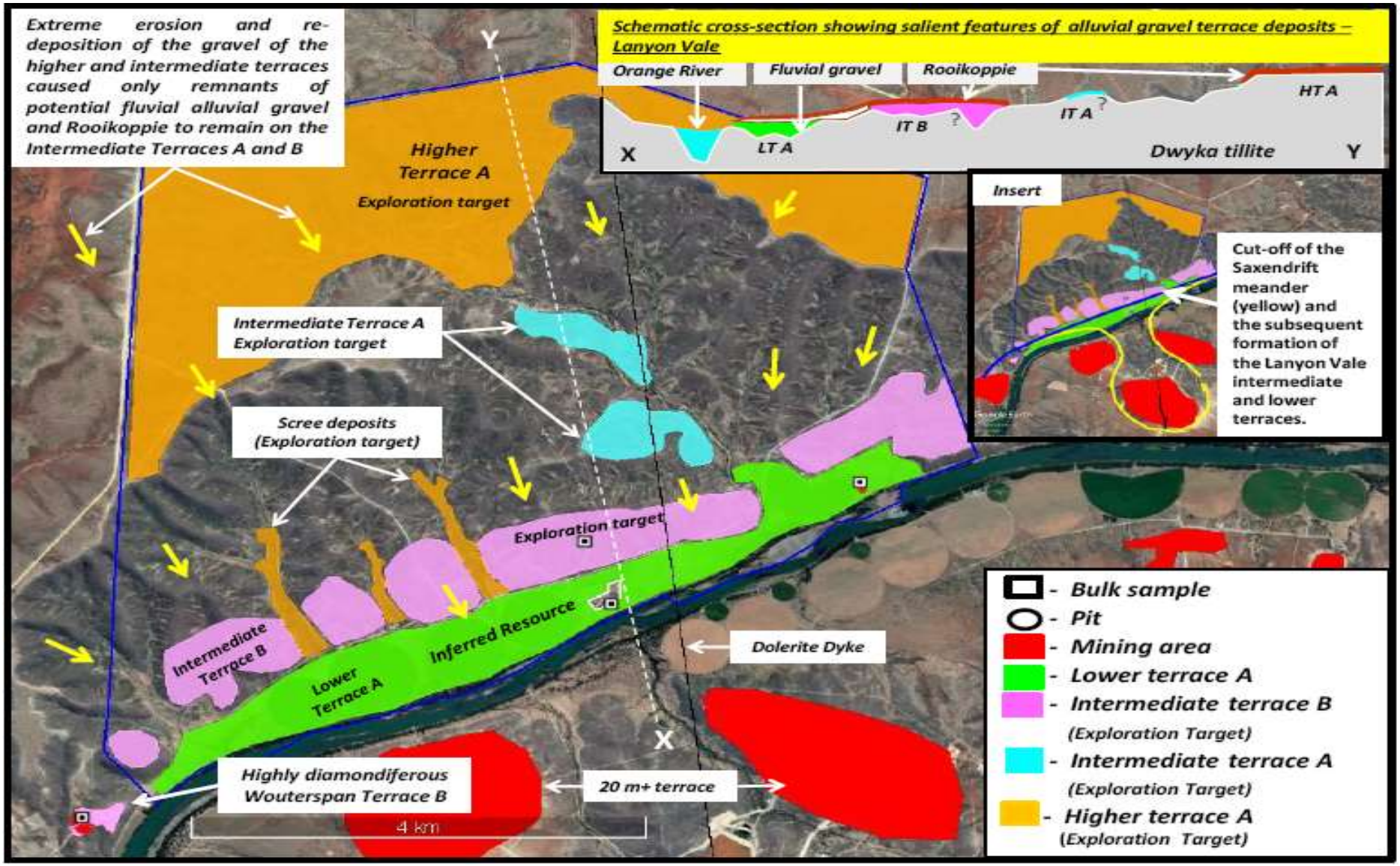


Figure 8. Satellite image showing Alluvial Deposits and inferred Resources on Lanyon Vale taken out of the independent Geologist Report done by Stephen Le Roux.

i) Details of the development footprint alternatives considered

With reference to the site plan provided as Appendix 4 and the location of the individual activities on site, provide details of the alternatives considered with respect to:

(a) the property on which or location where it is proposed to undertake the activity;
(b) the type of activity to be undertaken;
(c) the design or layout of the activity;
(d) the technology to be used in the activity;
(e) the operational aspects of the activity; and
(f) the option of not implementing the activity.

The registered description of the land to which the mining right application relates:

Property: **Portion 15 and Portion 23 of the farm Lanyon Vale no 376.**
District: Hay
Province: Northern Cape
Extent: 4 346.5033 ha

The property on which the Mining right was applied for is determined by the geological location of the mineral resource. Therefore, there are no alternatives for the location of the activity, except for not proceeding with the operation. This will however cause the underutilisation of a national economic resource.

The area is accessible via tar and gravel roads from different directions.

Infrastructure in the Siyancuma area is well developed with good road and rail networks, electricity grid and water. Experienced labour is available in the area as is an extensive network of secondary industries geared towards small and large-scale diamond mining. Water for Processing Plant will be a crucial element that needs to be secured towards the successful operating of the project. A water application will be submitted to the Department of Water and Sanitation which may include a Section 21 (a), (b), (g), (i) and (c) application.

Alternatives considered:-

As the area covered under the Mining Right had been selected based on the assumption of alluvial gravels and indication of the presence of alluvial gravels, it will not be viable to consider an alternative site for the mine. Alternatives for land are thus not available, as the mining right application can not be considered over another area.

Therefore there are no alternatives to the area.

(a) The type of activity to be undertaken:

The planned mining technique is that of a opencast alluvial diamond mining operation with oversize material from the gravel scalping and the tailings from the plant, being used as backfill material prior to final rehabilitation. Gravels are excavated, loaded and transported to the nearby treatment facility using articulated dump trucks. **No irrigation pivots will be disturbed or mined without prior agreement from the farm owners.**

Alternatives considered:-

The mining blocks is within the target area known to carry diamonds and therefore no alternative to the application area can be considred. The only alternative land use on the area that will be selected for the processing plant is agriculture / grazing; however the applicant's main economic activity is mining and for this reason does not favour any other alternative land use.

(b) The design or layout of the activity:

The site infrastructure will need to be strategically placed by incorporating mining project demands and environmental sensitivities identified during the Environmental Impact Assessment process. Thus, the site layout will primarily be based on proximity to the nearby access roads, proximity to the areas earmarked for mining as well as limited additional impact on the environmental (non-perrennial drainage lines, pivots the river and wind direction), heritage resources and discussions with the relevant interested and affected parties.

The following infrastructure will be established and will be associated with the mining operation outside the 1:100 year floodline zone with permission of the relevant competent authority and the surface owners:

- Processing Plant : 2 X 16 feet pans with conveyers and recovery per property.
- Ablution Facilities: In terms of sewage the decision was made to use chemical toilets which can be serviced regularly by the service provider.
- Clean & Dirty water system: Berms
  It is anticipated that the operation will establish stormwater control berms and trenches to separate clean and dirty water on the mine site.
- Fuel Storage facility (Concrete Bund walls and Diesel tanks):
  It is anticipated that the operation will utilize 2 x 23 000 litre diesel tanks. These tanks must be placed in bund walls, with a capacity of 1.5 times the volume of the diesel tanks. A concrete floor must be established where the re-fuelling will take place.
- Mining Area: Opencast mining to mine for alluvial diamonds.
- Roads (both access and haulage road on the mine site):
  Although it is recommended that the operation utilize existing roads as far as possible, it is anticipated that the mining operation will create an additional 2 - 4 km of roads, with a width of 15 meters.
- Salvage yard (Storage and laydown area).
- Product Stockpile area.
- Waste disposal site
  The operation will establish a dedicated, fenced waste disposal site with a concrete floor and bund wall. The following types of waste will be disposed of in this area:

- Small amounts of low level hazardous waste in suitable receptacles;
- Domestic waste;
- Industrial waste.

- Temporary Workshop Facilities and Wash bay.
- Water distribution Pipeline.
- Water tank :
  It is anticipated that the operation will establish 1 x 10 000 litre water tanks with purifiers for potable water.

Alternatives considered:-

Alternatives for fuel storage include surface storage, underground storage and the storage of fuel in mobile tanks with a metal bund wall. Underground storage has an adverse negative pollution potential, because it is not easy to monitor leakages. Remediation measures are also not as effective as compared to surface storage tanks. Mobile tanks are a viable option for infield screening activities, but the best viable long term option is the instalment of fuel tanks within a concrete bund wall.

In terms of water use alternatives; the operation is located next to the Orange River and the Mining area is next to the river. Plastic pipelines are considered to be the best long term option for transferring water, due to their temporary nature which causes minimum environmental disturbances.

Therefore, a pipeline route will be designed based on the principle of minimum impacts to the environment.

In terms of power generation the options available was for Generators or ESKOM power. All of the electricity needs for the operations will be generated by a diesel generator and there would therefore be no additional pressure on the Eskom Electricity Grid.

In terms of sewage the decision was made to use chemical toilets which can be serviced regularly by the service provider.

(c) The technology to be used in the activity:

- **Technique**
  The area will be excavated (opencast method) with an excavator up to bedrock, stockpiled next to an open area and loaded onto the trucks by a frond end loader. The trucks will transport the gravel via a newly constructed road, which will be constructed to the required safety standard. No provincial roads will be used.

  At the processing plant the run of mine will be fed onto a grizzly for the screening out oversize material. The gravel will be processed through a screening section for delivery to a recovery plant and associated equipment. In terms of the processing it should take place outside the 1:100 year floodline and a processing area will be

negotiated with the Department. This area will be used for all processing and stockpiling operations with an agreement entered into with the relevant Department).

- **Technology**
  At the processing plant the run of mine will be fed onto a grizzly for the screening out oversize material. The gravel will be processed through a screening section for delivery to a recovery plant and associated equipment. In terms of the processing it should take place outside the 1:100 year floodline and a processing area will be negotiated with the Department. This area will be used for all processing and stockpiling operations with an agreement entered into with the relevant Department).

  Alternatives considered:-

  The planned mining activities include (opencast method) with an excavator up to bedrock. The operation is also associated with processing techniques that make use of modern technologies. These are the most economic viable method currently being used by the diamond fraternity. There is no other feasible, alternative mining method for the mining and extraction of alluvial diamonds.

(d) The operational aspects of the activity:

The gravels will be loaded with an excavator on to dump trucks for conveyance to the Processing Plant. At the Processing Plant the run of mine gravels will be fed onto a grizzly for screening out oversize material. The material will be processed through a screening section for delivery to a recovery plant. Concentrate from the recovery plant will be processed through an X-Ray/Sortex plant to extract the diamonds. A area will be used for all processing and dumping operations outside the 1:100 year floodline. The expected lifespan of the mine is 10 years.

Mining activities will primarily make use of existing roads created by previous mining activities, but there is a possibility for additional roads that could be created.

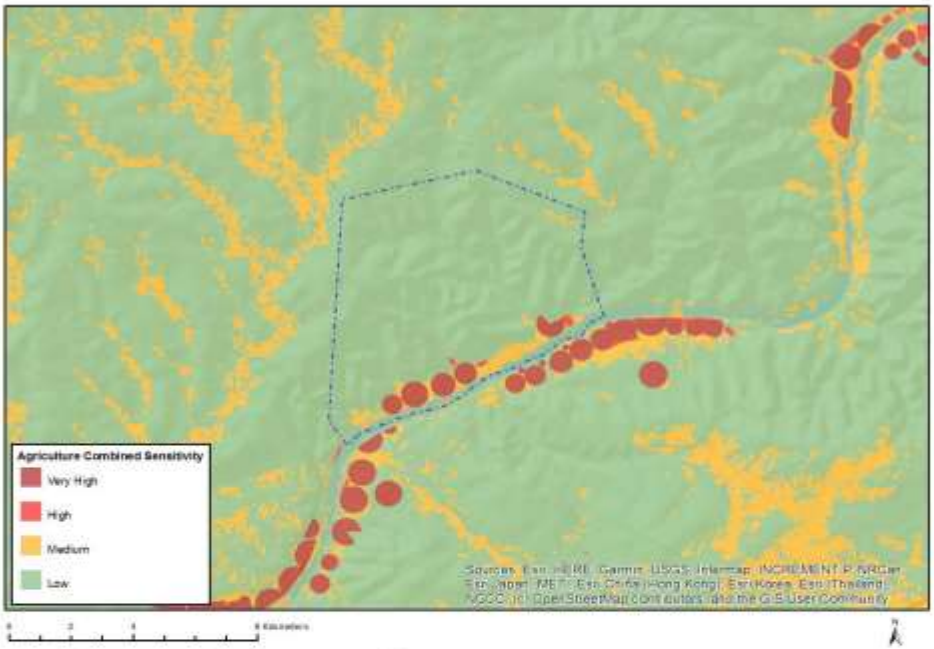
Alternatives considered:-

The conventional opencast load-haul-mining method has been proven to be the most economic viable method currently being used by the diamond fraternity. There is no other feasible, alternative mining method for the mining and extraction of alluvial diamonds.

(e) The option of not implementing the activity:

Potential land use includes grazing (game farming), agricultural (pivots) and mining. The majority of the area is classified to have potential for grazing land and agricultural use for crop yield. Therefore, mining activities are believed to be one of the economically beneficial options for the areas.

MAP OF RELATIVE AGRICULTURE THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			

Sensitivity Features:

Sensitivity	Feature(s)
High	Annual Crop Cultivation / Planted Pastures Rotation;Land capability;01. Very low/02. Very low/03. Low-Very low/04. Low-Very low/05. Low
High	Annual Crop Cultivation / Planted Pastures Rotation;Land capability;06. Low-Moderate/07. Low-Moderate/08. Moderate
Low	Land capability;01. Very low/02. Very low/03. Low-Very low/04. Low-Very low/05. Low
Medium	Land capability;06. Low-Moderate/07. Low-Moderate/08. Moderate
Very High	Pivot Irrigation;Land capability;01. Very low/02. Very low/03. Low-Very low/04. Low-Very low/05. Low
Very High	Pivot Irrigation;Land capability;06. Low-Moderate/07. Low-Moderate/08. Moderate

Socio-Economy

The operation will make provision for ±46 job opportunities. This will be lost if the project does not proceed. Substantial tax benefits to the State and Local Government will also be lost.

Heritage and Cultural Resources

The screening report done for the mining right application indicated a low sensitivity for Heritage but a high sensitivity for both areas in terms of Palaeontology.

The necessary specialist studies will be done to be included into the EIA/EMP documents. If the mining operation is approved, the heritage resources if any other had been encountered will be protected through the demarcation of no-go zones and fencing off.

MAP OF RELATIVE ARCHAEOLOGICAL AND CULTURAL HERITAGE THEME SENSITIVITY

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low sensitivity

MAP OF RELATIVE PALEONTOLOGY THEME SENSITIVITY

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
	X		

Sensitivity Features:

Sensitivity	Feature(s)
High	Features with a High paleontological sensitivity
Medium	Features with a Medium paleontological sensitivity

Biodiversity

In terms of the screening tool that had been done for the mining right application the application area falls into Critical Biodiversity Area 1 and 2 as well as ecological support areas. The necessary specialist studies will be done to confirm this.

MAP OF RELATIVE TERRESTRIAL BIODIVERSITY THEME SENSITIVITY

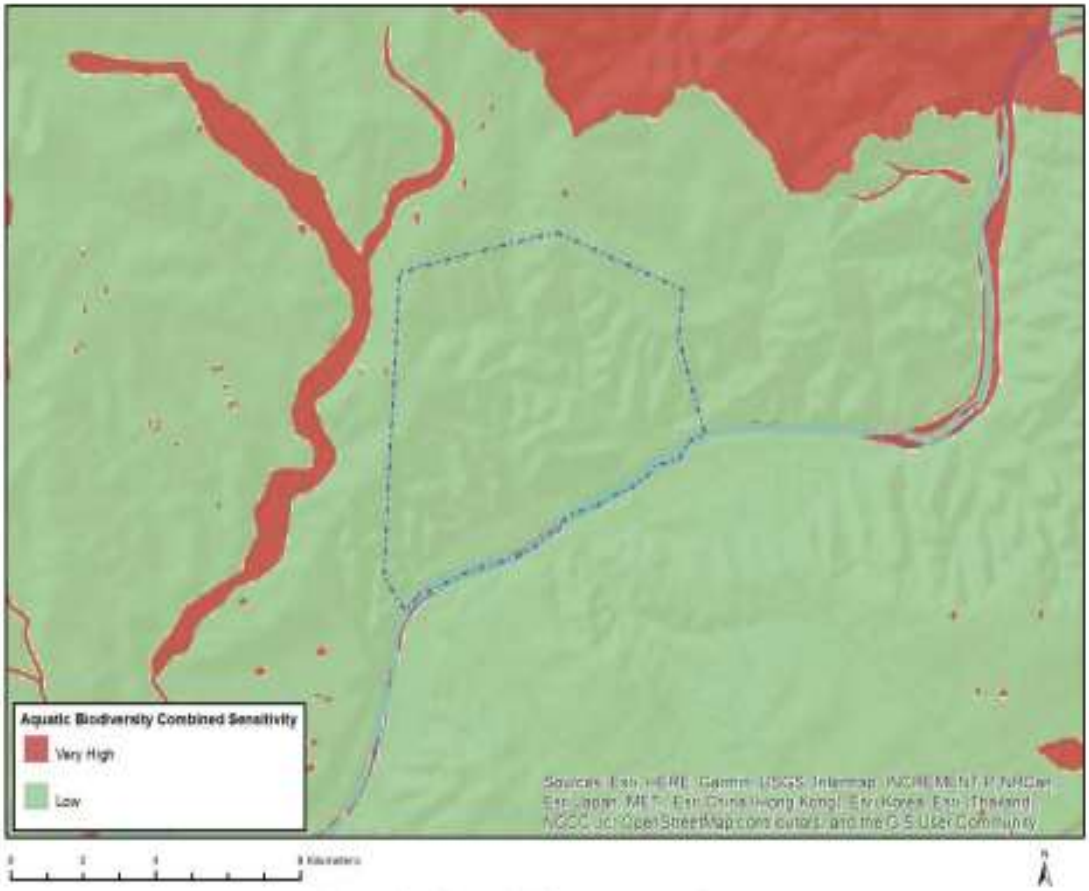
Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low Sensitivity
Very High	Critical Biodiversity Area 1
Very High	Critical Biodiversity Area 2
Very High	Ecological Support Area

Figure 9. Final site layout plan in terms of the screening tool for Terrestrial Biodiversity

MAP OF RELATIVE AQUATIC BIODIVERSITY THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low sensitivity
Very High	Wetlands and Estuaries

ii) Details of the Public Participation Process Followed

Describe the process undertaken to consult interested and affected parties including public meetings and one on one consultation. NB the affected parties must be specifically consulted regardless of whether or not they attended public meetings. (Information to be provided to affected parties must include sufficient detail of the intended operation to enable them to assess what impact the activities will have on them or on the use of their land.

A copy of the draft Scoping Report (burned to disc) was sent to all identified interested and affected parties. All Government Departments identified were also notified by registered letters. The surface owners also received registered letters.

A notice will also placed on the gates at the entrance of the proposed site to invite any other interested parties to come forward and to register. Other notices will be brought up at relevant public places to inform the communities in the surrounding area of the proposed mining operation.

The draft Scoping Report was also placed at the Douglas public Library along with a notice to notify the public of the proposed mining operation as well as to provide access to the draft Scoping Report to the community.

Furthermore, an advert will be placed in the DFA Newspaper in the third week of April 2022 which invited any other interested or affected party to come forward and register.

Proof of consultation (attendance registers, minutes of meetings and response forms) is attached as **Appendix 3**. The consultation process is still in process.

Summary of issues raised by I&APs

(Complete the table summarising comments and issues raised, and reaction to those responses)

Table 3. Consultation with I&Aps

PLEASE SEE ATTACHED AS APPENDIX 3

iv) The Environmental attributes associated with the development footprint alternatives (The environmental attributed described must include socio-economic, social, heritage, cultural, geographical, physical and biological aspects)

(1) Baseline Environment

(a) Type of environment affected by the proposed activity
(its current geographical, physical, biological, socio-economic, and cultural character)

(1) GEOLOGY:

All information is taken out of the Independent Statement of diamond resources and exploration targets done in January 2019 by Mr. Stephen H. le Roux on At Last, De Bad and Lanyon Vale projects.

Geological Setting

Alluvial geology of the Kimberley area1:
The erosion of diamondiferous kimberlites liberates diamonds onto the land surface, for redistribution by streams and rivers. The processes that lead to the deposition and concentration of diamonds in river sediments are obviously of direct importance in the formation of economic alluvial diamond deposits.

The South African alluvial deposits are distributed in a southwest-trending belt that stretches from the Limpopo River to the Namaqualand coast. The major deposits are concentrated along the Vaal and Orange River valleys and some tributaries of the Vaal River. The deposits invariably consist of gravel resting on Precambrian bedrock.

This bedrock contains trap sites for diamonds in the form of scour channels, potholes, gulleys and plunge pools, and in all cases, its competence and irregularity are sufficient to trap coarse debris that, in turn, act to entrain diamonds. The bedrock comprises a wide variety of rock types, including granite, gneiss, lava, dolomite, tillite, shale and quartzite, and cross-cutting dykes perpendicular to the fluvial channels and paleochannels are important in the development of trap sites.

The diamonds were originally derived from kimberlites on the Kalahari Craton, mostly within South Africa and transported by rivers to their placer sites. Many of these placers were subsequently reworked during the Cenozoic and redeposited as younger placers in downstream locations as depicted in the schematic illustration below (figure 10).

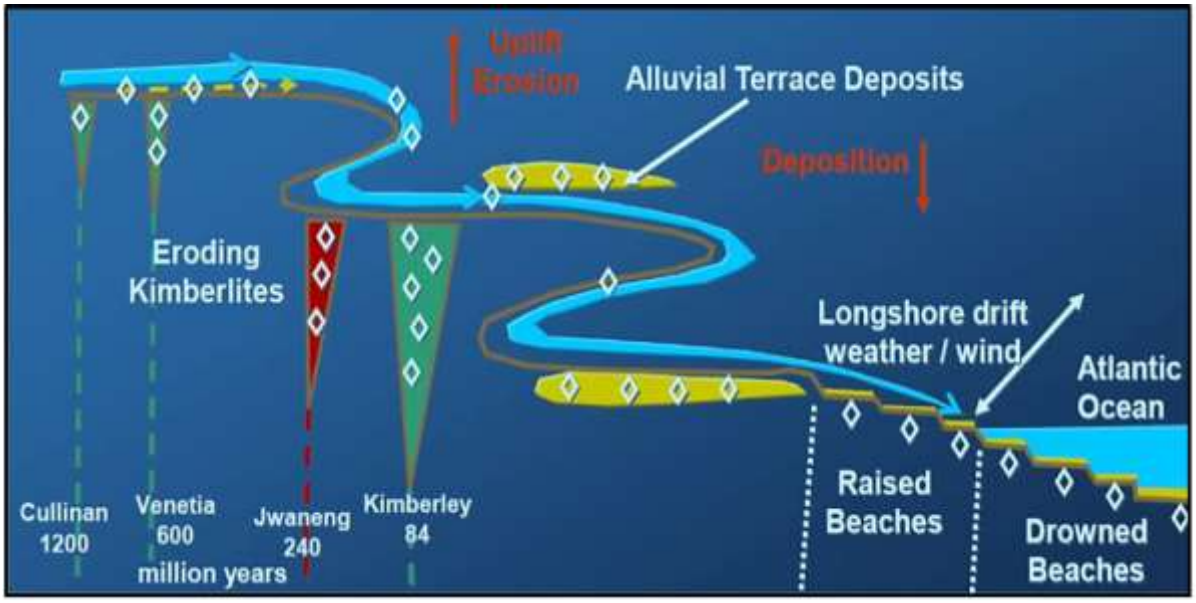


Figure 10. Origin of Alluvial Diamond Deposits.

The age of the alluvial placers ranges from Late Cretaceous to Quaternary with depositional peaks coinciding with fluvial phases during the Late Cretaceous, Miocene and Plio-Pleistocene. These ages post-date the emplacement of all the diamondiferous kimberlites on the Kalahari Craton from which the diamonds were derived.

Deposits of Miocene, Pliocene and Pleistocene age occur along the Vaal River valley between Christiana and Douglas and along the Orange River valley between Hopetown and Prieska. These deposits are located at elevations between present river level and 120m above present river levels. The diamonds were probably transported from kimberlites located near Kroonstad, Welkom, Theunissen, Boshof, Koffiefontein, and in northern Lesotho via former drainage courses of the Vals, Vet, Riet and Orange Rivers and a so-called Kimberley River that tapped the Boshof kimberlites prior to being captured by the Modder River during the Pliocene.

Studies of the Lower Vaal, Harts and Middle Orange River (MOR) alluvial deposits show that there are five broad phases of prominent alluvial deposit development in these areas reflected by several deposit types.

Cretaceous aged Nooitgedacht-Droogeveldt Terraces are considered to be the oldest alluvial deposits and they occur between 80 - 120 meters above the modem Vaal River S-W of Barkly West. These deposits probably conform in age to the initial period of late-Cretaceous uplift which triggered a period of accelerated river incision and simultaneous erosion and lowering of the land surfaces, accompanied by the supply of detritus, including diamonds.

Miocene-age Holpan and Klipdam Channel deposits occur at approximately 60 meters above the Vaal River. Younger terraces include the Pliocene-age Proksch Koppie and Wedburg Terraces, which occur at 30 - 45 and 20 - 30 meters respectively.

Pliocene - Holocene deposits or the youngest terraces, which include the current Vaal River channel, occur between 0 - 20 meters and are collectively referred to as the Rietputs and Riverton Terraces.

Younger deposits, through a process of progressive weathering, deflation and winnowing of the above deposits, 'secondary' deposits known as Rooikoppies developed over large areas of the landscape. Typically, these deposits are found to be broadly associated with older terraces and buried channels, these readily accessible deflation deposits were extensively mined by the old timers and Diggers. In many cases the presence of Rooikoppie deposits was useful in respect of highlighting the presence of older buried deposits.

Hundreds of thousands of carats and numerous large stones have been produced from these terraces at various projects with grades varying between 0.1 and 2.0 cpht.

Geology of the Lower Vaal and Middle Orange River Deposits

Prior to the Karoo period, the (pre-Karoo) Vaal River cut a network of channels closely approximating the present floodplain. These channels were then utilized by the subsequent glaciers and were finally filled with Dwyka tillites and shales (at ±250 million years). The post-Karoo Vaal River, subsequently, incised into these formations and deposited gravels and large quantities of fine sediments.

The geological settings of the diamondiferous gravel deposits vary from thick remnant palaeo-river terraces and channels of late Cretaceous age through to young surface deflation or Rooikoppie deposits of 0.5 – 1.0 meters thick.

Through geological time, erosion and deflation of the very extensive primary gravel deposits lead to the formation of extensive lag deposits or Rooikoppie which in places were particularly rich. These deposits are generally associated with underlying primary gravels but mass weathering, material creep and movement of the heavier lag deposits down slopes has resulted in deposits which may be far more extensive than the underlying primary deposits.

Rooikoppie gravels have been extensively dug by the old-time diggers in the past, using unsophisticated mining and diamond recovery techniques. Highly fractured Ventersdorp lavas or Dwyka tillites underlie the Rooikoppie gravels. Iron has stained the entire assemblage, giving it a reddish colour and hence the
name Rooikoppie.

Magmatic intrusions are in the form of Karoo-aged dolerite sills and dykes and Cretaceous-aged kimberlites.

In the Lower Vaal and MOR area dry periods lead to the precipitation of an extensive hard calcrete horizon which effectively defines the "interface"

between the surface Rooikoppies and lower primary gravel deposits in many areas.

The calcrete prevented old time diggers from mining below the Rooikoppies and consequently large areas of primary gravel are being mined in areas such as the MOR by drilling, blasting and stripping the hard 1 to 2 meter calcrete layer and mining and processing the underlying preserved primary alluvial gravels.

Property Geology and Geological Model – Lanyon Vale

Alluvial diamondiferous gravels are found in the area as remnants of ancient terrace deposits occurring at different elevations above the floor of the present Orange River. Terrace elevations in the MOR area vary from a few metres to about 110m above the floor of the current river position.

These terraces are represented by a set of 'stepped terraces' showing the strongest preservation at the following heights above the present Orange River:

- 0 - 20m: low level terrace;
- 30 - 60m: intermediate terrace;
- 75 - 105m: high level terrace.

The terraces can display all the typical braided stream features such as channels, point bars and sandbanks and comprise a sedimentary package of:

- Rooikoppie (0.5 - 3m)
- Calcrete capping (1 - 3m)
- Intermediate, sandy gravel (1 - 5m)
- Coarse basal gravels (1 - 5m)

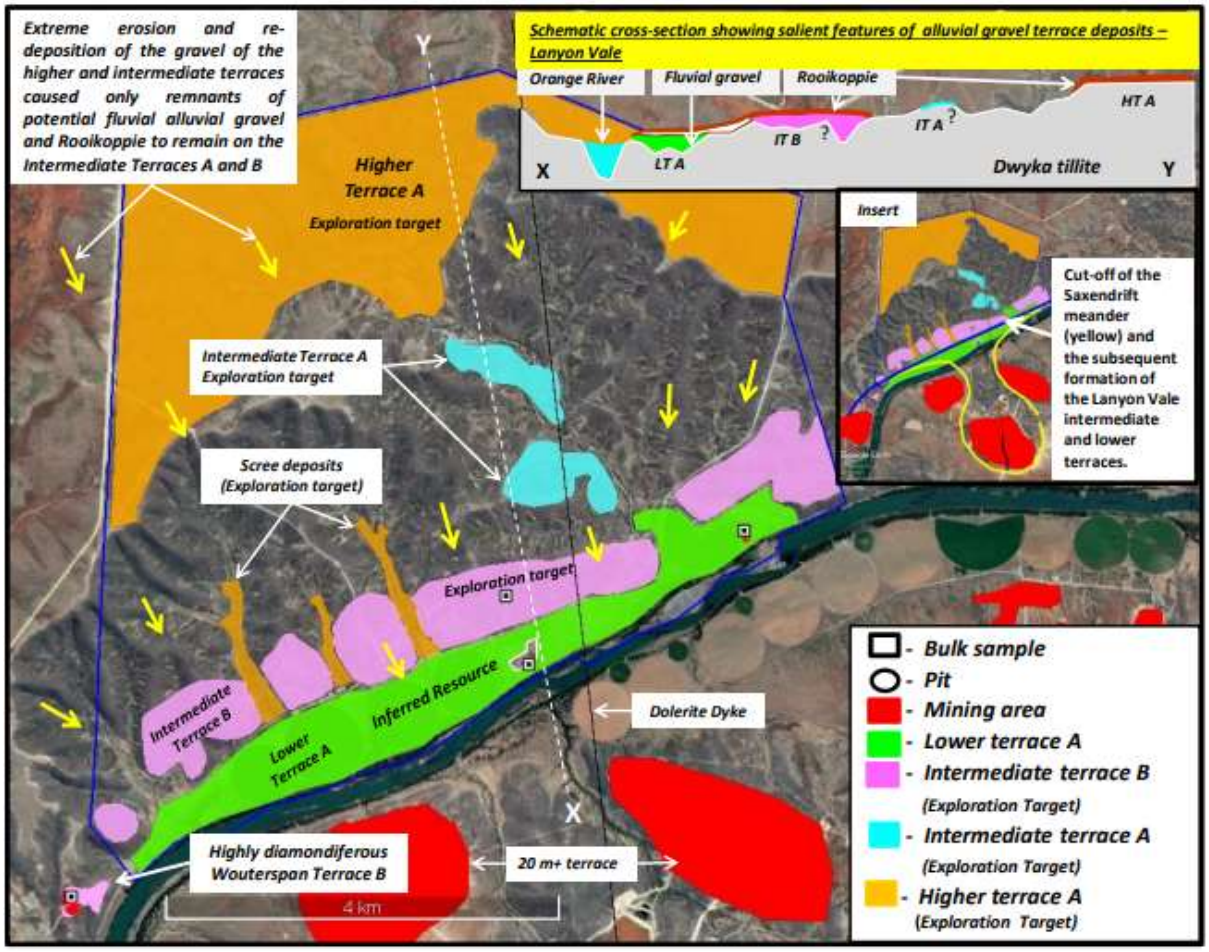


Figure 11. Satellite image showing Alluvial Diamond Deposits and Inferred Resources on Lanyon Vale.

The erosion and reworking of the intermediate terraces at Lanyon Vale caused only remnants of potential fluvial alluvial gravel and overlying Rooikoppie gravels to remain on these terraces. The highly diamondiferous and well-known Wouterspan B terrace are situated adjacent and on the same level as the intermediate B terraces at Lanyon Vale, which makes the vastly underexplored intermediate B terrace on Lanyon Vale, a highly prospective target to pursue.

Historic bulk sampling on the Wouterspan B terrace deliver grades between 0.4 – 0.6 cpht with average stone sizes bigger than 2.0 ct/stone.

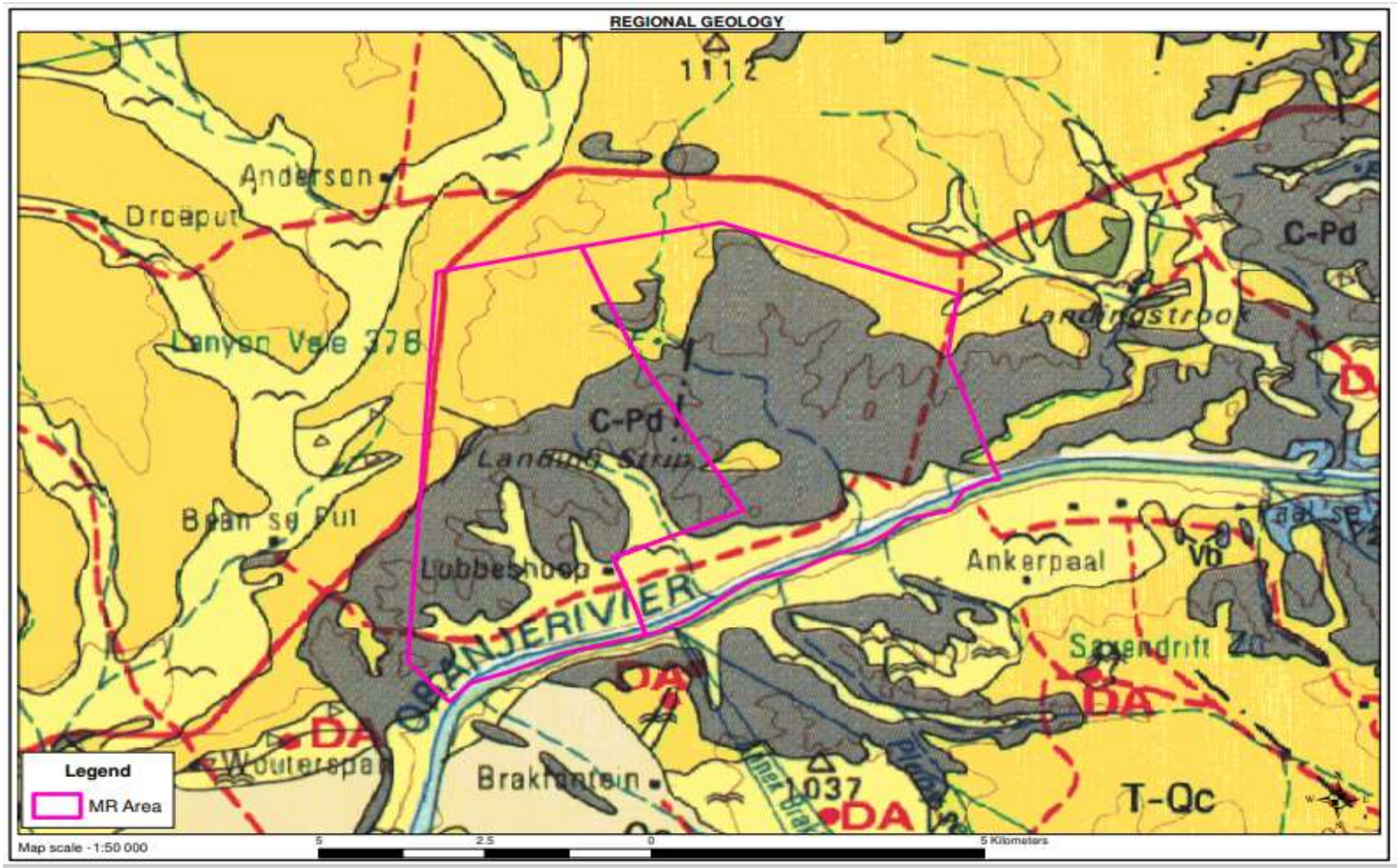


Figure 12. Geological map of Lanyon Vale

(2) ***CLIMATE:***

Darius van Rensburg from DPR Ecologists and Environmental Services has been appointed by Renaissance Resources to provide a Desktop Ecological and Wetland assessment in June 2018 for alluvial diamond mining prospecting on Portions 15 and 23 of the farm Lanyon Vale 376 near Douglas, and to determine the possible impact of prospecting on the application area Climate was described and included in this report.

The region has an approximate mean annual rainfall of 260mm per annum which occurs largely as thunderstorms between October and April with a mean annual evaporation of 200–300 mm/annum This is considered a relatively low rainfall and causes the area to form part of the more arid parts of South Africa. The occurrence of wetlands are therefore not common, however, due to the proximity to the Orange River the area adjacent to the river contains a high number of watercourses and several wetlands associated with the marginal zone of the Orange River. The surface water runoff in the area is restricted to very high rainfall events that results in an estimated mean annual runoff (MAR) for the area between 0-2.5 mm. The mean maximum and minimum temperatures of the region are 39˚C and -2.3˚C.

(3) **Topography**

Darius van Rensburg from DPR Ecologists and Environmental Services has been appointed by Renaissance Resources to provide a Desktop Ecological and Wetland assessment in June 2018 for alluvial diamond mining prospecting on Portions 15 and 23 of the farm Lanyon Vale 376 near Douglas, and to determine the possible impact of prospecting on the application area Topography was described and included in this report.

It is clear that the study area contains a highly varied topography. From aerial images and contours of the study area it is likely that the northern portion is dominated by an undulating plateau with numerous watercourses bisecting it (Map 1). The south eastern portion of the site descends from the plateau into a very uneven terrain dominated by hills bisected by a high number of watercourses (Map 1). The elevation decreases steadily along this uneven rocky terrain toward the Orange River which forms the southern border of the site. Along the river a wide and extensive floodplain is present and also contains the centre-pivot irrigation previously mentioned. The topography is natural and no visible modification is present. Altitude in the study area varies from 1066 m to 944 m along the Orange River. This also indicates the highly variable topography. This variable topography contributes to the high number of watercourses in the study area and will undoubtedly also increase the habitat and species diversity considerably.

The southern portion of the property along the Orange River has been transformed as a result of agriculture farming and there is a farmstead along the southern section of the farm. A large number of small drainage channels and rivers draining into the Orange River bisects the property. (figure 13).

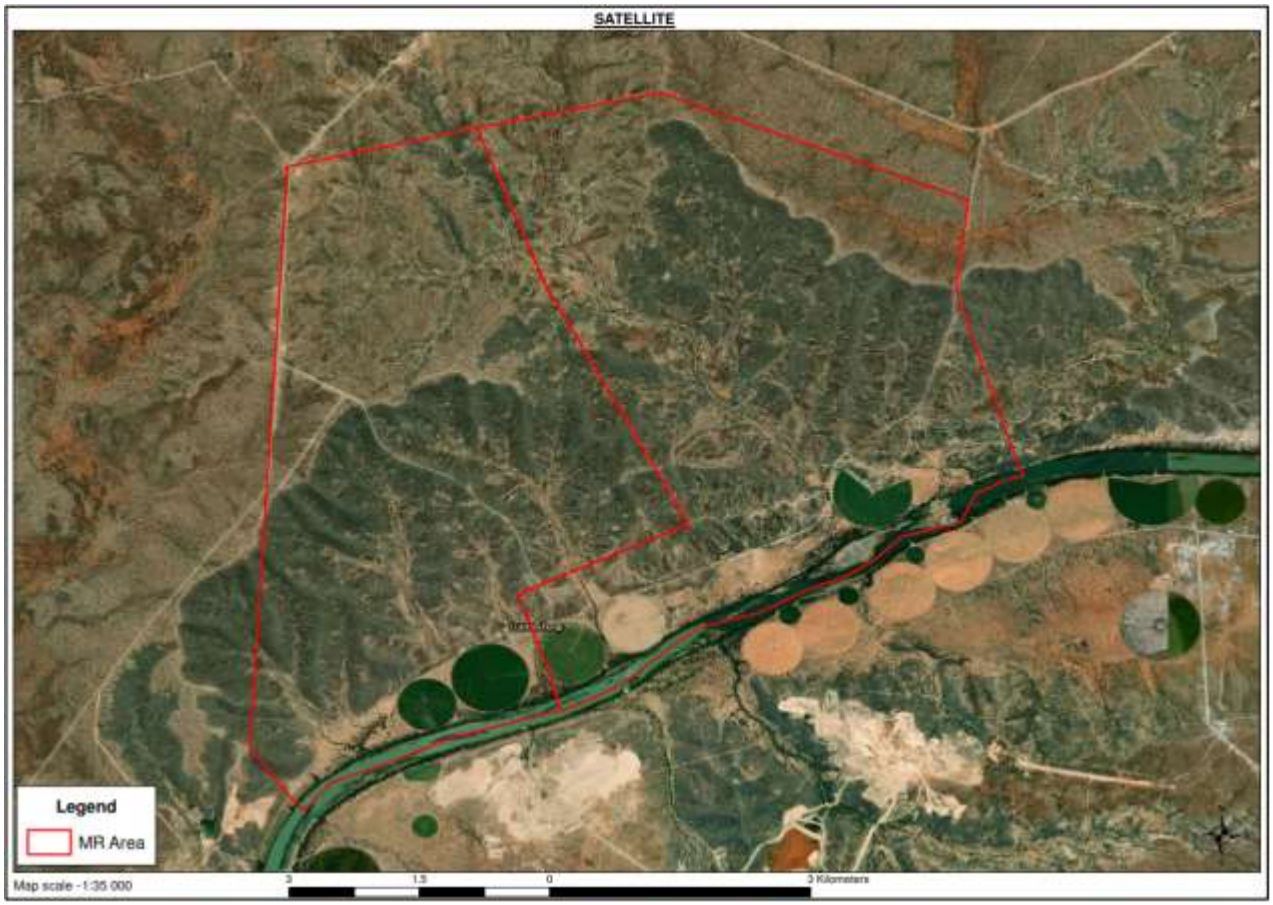


Figure 13. Satellite image of Application area on Lanyon Vale

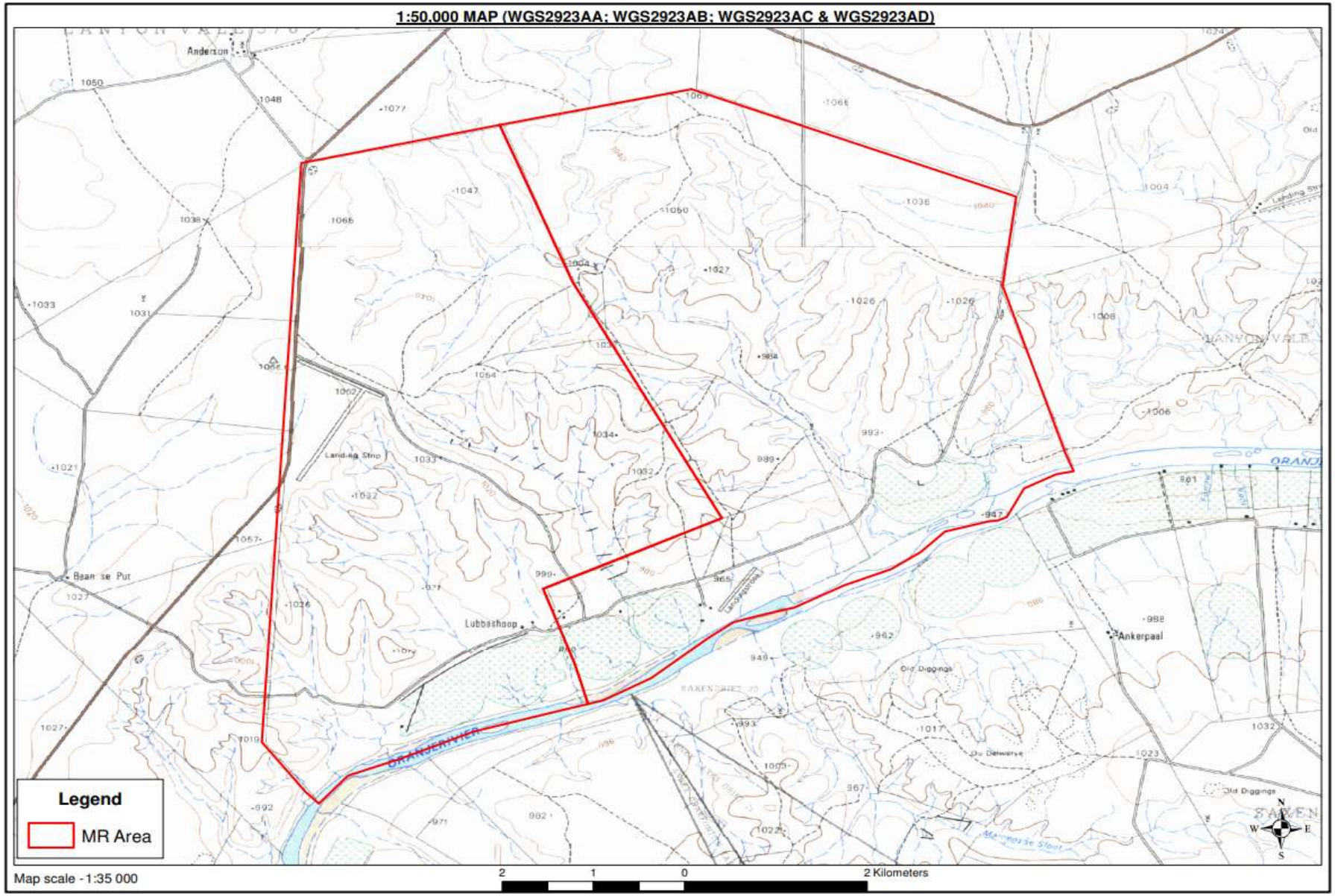


Figure 14. Topographical Map 1:50 000 application area indicated by red block.

(4) Soils

Darius van Rensburg from DPR Ecologists and Environmental Services has been appointed by Renaissance Resources to provide a Desktop Ecological and Wetland assessment in June 2018 for alluvial diamond mining prospecting on Portions 15 and 23 of the farm Lanyon Vale 376 near Douglas, and to determine the possible impact of prospecting on the application area soil was described and included in this report.

Soils of the area are predominantly of the Clovelly, Coega, Glenrosa and Katspruit forms and range from shallow stony to deep sandy soils (DPR, June 2018).

The project area is located on the northern banks of the Orange River and has a high possibility of containing diamondiferous gravels. The farm is close the Wouterspan, Brakfontein/Saxondrift and Nuwejaarskraal where diamonds, large in size and high quality were mined.

(5) Pre-mining Land Capability

The current land uses of the project area and surroundings can be best described as agricultural lands, livestock and/or game farming and mining in the district.

(6) Land Use

Darius van Rensburg from DPR Ecologists and Environmental Services has been appointed by Renaissance Resources to provide a Desktop Ecological and Wetland assessment in June 2018 for alluvial diamond mining prospecting on Portions 15 and 23 of the farm Lanyon Vale 376 near Douglas, and to determine the possible impact of prospecting on the application area land use was described and included in this report.

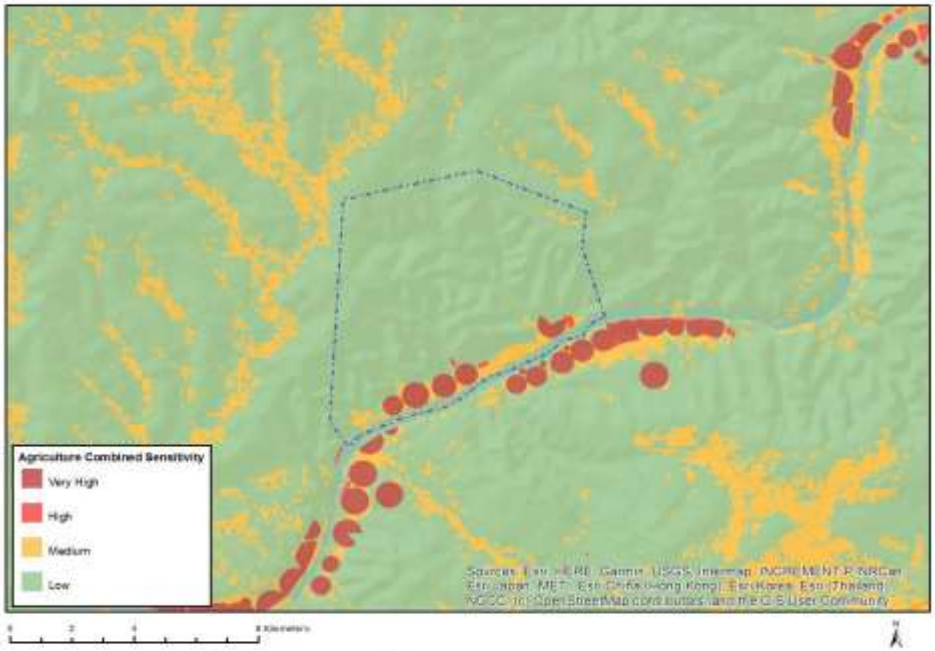
As previously mentioned the entire study area seems to consist of natural vegetation with few impacts present**. The current landuse is most likely associated with farming activities. Associated with this can be discerned a sparse network of gravel roads and dirt tracks, a farmstead associated with a few buildings and five centre-pivot irrigation areas. The latter considered to be the most prominent impact in the study area (DPR, June 2018).**

The current land uses of the project area and surroundings can be best described as agricultural lands, livestock and/or game farming and mining in the district.

Specific environmental features and/or infrastructure occur on site or within close proximity include:

- Agricultural lands
- Farm buildings
- Landing strip
- Orange river
- Water boreholes

MAP OF RELATIVE AGRICULTURE THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			

Sensitivity Features:

Sensitivity	Feature(s)
High	Annual Crop Cultivation / Planted Pastures Rotation;Land capability;01. Very low/02. Very low/03. Low-Very low/04. Low-Very low/05. Low
High	Annual Crop Cultivation / Planted Pastures Rotation;Land capability;06. Low-Moderate/07. Low-Moderate/08. Moderate
Low	Land capability;01. Very low/02. Very low/03. Low-Very low/04. Low-Very low/05. Low
Medium	Land capability;06. Low-Moderate/07. Low-Moderate/08. Moderate
Very High	Pivot Irrigation;Land capability;01. Very low/02. Very low/03. Low-Very low/04. Low-Very low/05. Low
Very High	Pivot Irrigation;Land capability;06. Low-Moderate/07. Low-Moderate/08. Moderate

(7) Flora and Fauna

Darius van Rensburg from DPR Ecologists and Environmental Services has been appointed by Renaissance Resources to provide a Desktop Ecological and Wetland assessment in June 2018 for alluvial diamond mining prospecting on Portions 15 and 23 of the farm Lanyon Vale 376 near Douglas, and to determine the possible impact of prospecting on the application area fauna and flora was described and included in this report.

From aerial images the site appears to consist almost entirely of natural vegetation although a small portion along the southern border contains centre-pivot irrigation which would transform a portion of the study area (Map 1). These centre-pivots however do not cover a large portion of the site but would have transformed the natural vegetation. They seem to be located within the floodplain of the Orange River. The site does not contain any mining activities

either current or historical although areas to the south and east of the study area has clearly been subjected to mining operations. The study area is situated within the Karoo Biome and specifically the Nama Karoo Bioregion. The vegetation structure should therefore be dominated by a dwarf karroid shrub layer. A succulent, tree and grass component is also likely to be present but in the absence of an on-site survey the percentage cover cannot be estimated. However, studies within the surrounding areas has indicated that a significant but low tree layer is present in many areas and dominated by the low growing Blackthorn (Senegalia melifera subsp. detinens). Topography visible from aerial images indicate significant variation and this will also contribute significantly toward a varied vegetation structure and high species diversity (DPR, June 2018).

Vegetation types occurring in the study area consist of Northern Upper Karoo (NKu 3) and Upper Gariep Alluvial Vegetation (Aza 4). According to the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) both of these vegetation types are considered to be of Least Concern (LC) and not currently subjected to any pronounced development pressures (Map 2).

In the absence of a site survey a general description of the vegetation composition is given as obtained from Mucina & Rutherford (2006). This is by no means a comprehensive description of the vegetation but should give a general description.

Northern Upper Karoo (NKu 3)
Important Taxa Small Trees: Acacia mellifera subsp. detinens, Boscia albitrunca. Tall Shrubs: Lycium cinereum, L. horridum, L. oxycarpum, L. schizocalyx, Rhigozum trichotomum. Low Shrubs: Chrysocoma ciliata, Gnidia polycephala, Pentzia calcarea, P. globosa, P. incana, P. spinescens, Rosenia humilis, Amphiglossa triflora, Aptosimum marlothii, A. spinescens, Asparagus glaucus, Barleria rigida, Berkheya annectens, Eriocephalus ericoides subsp. ericoides, E. glandulosus, E. spinescens, Euryops asparagoides. Felicia muricata, Helichrysum lucilioides, Hermannia spinosa, Leucas capensis, Limeum aethiopicum, Melolobium candicans, Microloma armatum, Osteospermum leptolobum, O. spinescens, Pegolettia retrofracta, Pentzia lanata, Phyllanthus maderaspatensis, Plinthus karooicus, Pteronia glauca, P. sordida, Selago geniculata, S. saxatilis, Tetragonia arbuscula, Zygophyllum lichtensteinianum. Succulent Shrubs: Hertia pallens, Salsola calluna, S. glabrescens, S. rabieana, S. tuberculata, Zygophyllum flexuosum. Semiparasitic Shrub: Thesium hystrix, Herbs: Chamaesyce inaequilatera, Convolvulus sagittatus, Dicoma capensis, Gazania krebsiana, Hermannia comosa, Indigofera alternans, Lessertia pauciflora, Radyera urens, Sesamum capense, Sutera pinnatifida, Tribulus terrestris, Vahlia capensis. Succulent Herb: Psilocaulon coriarium. Geophytic Herb: Moraea pallida.Graminoids: Aristida adscensionis, A. congesta, A. diffusa, Enneapogon desvauxii, Eragrostis lehmanniana, E. obtusa, E. truncata, Sporobolus fimbriatus, Stipagrostis obtusa, Eragrostis bicolor, E. porosa, Fingerhuthia africana, Heteropogon contortus, Stipagrostis ciliata, Themeda triandra, Tragus berteronianus, T. koelerioides, T. racemosus.

Biogeographically Important Taxa Herb (western distribution limit): Convolvulus

boedeckerianus. Tall Shrub (southern limit of distribution): Gymnosporia szyszylowiczii subsp. namibiensis.

Endemic Taxa Succulent Shrubs: Lithops hookeri, Stomatium pluridens. Low Shrubs: Atriplex spongiosa, Galenia exigua. Herb: Manulea deserticola

Upper Gariep Alluvial Vegetation (Aza 4)

Important Taxa Riparian thickets Small Trees: Acacia karroo, Celtis africana, Salix mucronata subsp. mucronata. Tall Shrubs: Diospyros lycioides, Melianthus comosus, Rhus pyroides. Low Shrubs: Asparagus setaceus, A. suaveolens. Woody Climber: Clematis brachiata. Succulent Shrubs: Lycium arenicola, L. hirsutum. Herb: Rubia cordifolia. Flooded grasslands & herblands Graminoid: Melica decumbens. Herbs: Cineraria dregeana, C. lobata.

As previously mentioned the study area is also located within the Griqualand West Centre of Endemism (Van Wyk & Smith 2001). This is one of 19 regions identified across South Africa as having a high percentage of endemic species, i.e. species only occurring in these areas and nowhere else. These are therefore considered to be of significant conservation value.
Furthermore, being confined to unique habitats and with a restricted distribution, many are also listed as Red Listed species. Species endemic to this region include:

Aizoon asbestinum
Euphorbia bergii
Euphorbia inornata
Euphorbia planiceps
Euphorbia rectirama
Euphorbia wilmaniae
Prepodesma orpenii
Hereroa wilmaniae
Ebracteol wilmaniae
Lithops aucampiae subsp. aucampiae var. aucampiae
Lithops aucampiae subsp. aucampiae var. koelemanii
LIthops bromfieldii var. glaudinae
Lithops leslei var. burchellii

It is considered highly likely that at least some of these will occur in the study area. The listed species are also all protected species in terms of Schedule 1 and Schedule 2 of the Northern Cape Nature Conservation (NCNCA) Act No. 9 of 2009 whilst the last is also listed as being a Red Data List species with Near Threatened status.

Previous studies conducted in the surrounding area (Milne 2016) has also identified numerous protected species and include the following:

Table 4: Protected species recorded in the surrounding areas (Milne 2016).
DDD – Data Deficient - Insufficient Information (DDD) A species is DDD when there is inadequate information to make an assessment of its risk of extinction, but the species is well defined. Listing of species in this category indicates that

more information is required and that future research could show that a threatened classification is appropriate.

DDT – Data Deficient - Taxonomically Problematic (DDT) A species is DDT when taxonomic problems hinder the distribution range and habitat from being well defined, so that an assessment of risk of extinction is not possible.

VU – Vulnerable (VU) A species is Vulnerable when the best available evidence indicates that it meets at least one of the five IUCN criteria for Vulnerable, indicating that the species is facing a high risk of extinction.

Rare – Rare A species is Rare when it meets at least one of four South African criteria for rarity but is not exposed to any direct or plausible potential threat and does not qualify for a category of threat according to one of the five IUCN criteria.

FAMILY	Scientific name	Status
ACANTHACEAE	*Acanthopsis hoffmannseggiana*	DDT
AIZOACEAE	*Aizoon asbestinum*	
AIZOACEAE	*Aizoon schellenbergii*	
AIZOACEAE	*Galenia africana*	
AIZOACEAE	*Plinthus cryptocarpus*	
AIZOACEAE	*Plinthus karooicus*	
AIZOACEAE	*Tetragonia arbuscula*	
AIZOACEAE	*Trianthema parvifolia* var. *parvifolia*	
AMARYLLIDACEAE	*Amaryllidaceae* sp.	
AMARYLLIDACEAE	*Nerine laticoma*	
APIACEAE	*Deverra denudata* subsp. *aphylla*	
APOCYNACEAE	*Cynanchum virens*	
APOCYNACEAE	*Gomphocarpus tomentosus* subsp. *tomentosus*	
APOCYNACEAE	*Hoodia gordonii*	DDD
APOCYNACEAE	*Orbea lutea* subsp. *lutea*	
APOCYNACEAE	*Pachypodium succulentum*	
APOCYNACEAE	*Sarcostemma viminale* subsp. *viminale*	
APOCYNACEAE	*Stapelia flavopurpurea*	
ASPHODELACEAE	*Aloe claviflora*	
ASPHODELACEAE	*Aloidendron dichotomum*	VU
ASPHODELACEAE	*Bulbine abyssinica*	
ASPHODELACEAE	*Bulbine frutescens*	
ASPHODELACEAE	*Haworthia venosa* subsp. *tessellata*	
ASTERACEAE	*Senecio erysimoides*	DDT
ASTERACEAE	*Senecio gariepiensis*	DDD
CAPPARACEAE	*Boscia albitrunca*	
CARYOPHYLLACEAE	*Dianthus namaensis* var. *dinteri*	
CELASTRACEAE	*Gymnosporia polyacantha*	
CHENOPODIACEAE	*Salsola apiciflora*	DDT
CRASSULACEAE	*Cotyledon orbiculata* var. *oblonga*	
CRASSULACEAE	*Crassula atropurpurea* var. *atropurpurea*	
CRASSULACEAE	*Crassula deceptor*	
CRASSULACEAE	*Crassula muscosa* var. *muscosa*	
CRASSULACEAE	*Kalanchoe brachyloba*	
EUPHORBIACEAE	*Euphorbia avasmontana* var. *avasmontana*	
EUPHORBIACEAE	*Euphorbia braunsii*	
EUPHORBIACEAE	*Euphorbia gariepina*	
EUPHORBIACEAE	*Euphorbia inaequilatera*	
EUPHORBIACEAE	*Euphorbia mauritanica*	

FABACEAE	*Lessertia macrostachya* var. *macrostachya*	
FABACEAE	*Lessertia pauciflora* var. *pauciflora*	
IRIDACEAE	*Lapeirousia plicata* subsp. *plicata*	
IRIDACEAE	*Moraea polystachya*	
IRIDACEAE	*Sparaxis villosa*	
MESEMBRYANTHEMACEAE	*Antimima watermeyeri*	
MESEMBRYANTHEMACEAE	*Aridaria noctiflora* subsp. *straminea*	
MESEMBRYANTHEMACEAE	*Drosanthemum hispidum*	
MESEMBRYANTHEMACEAE	*Mesembryanthemum crystallinum*	
MESEMBRYANTHEMACEAE	*Phyllobolus amabilis*	**Rare**
MESEMBRYANTHEMACEAE	*Psilocaulon coriarium*	
MESEMBRYANTHEMACEAE	*Ruschia canonotata*	
MESEMBRYANTHEMACEAE	*Ruschia spinosa*	
MESEMBRYANTHEMACEAE	*Ruschia vulvaria*	
MESEMBRYANTHEMACEAE	*Titanopsis calcarea*	
MESEMBRYANTHEMACEAE	*Trichodiadema pomeridianum*	
OLEACEAE	*Olea europaea* subsp. *africana*	
OXALIDACEAE	*Oxalis haedulipes*	
OXALIDACEAE	*Oxalis lawsonii*	
PORTULACACEAE	*Anacampseros filamentosa* subsp. *filamentosa*	
SCROPHULARIACEAE	*Jamesbrittenia argentea*	
SCROPHULARIACEAE	*Jamesbrittenia atropurpurea* subsp. *atropurpurea*	
SCROPHULARIACEAE	*Jamesbrittenia integerrima*	
SCROPHULARIACEAE	*Manulea* sp.	
SCROPHULARIACEAE	*Nemesia* sp.	

It is considered highly likely that the study area will also contain most of these protected and Red Listed species. The tree, Boscis albitrunca (Shepherd's Tree), is also listed as protected under the National Forests (NFA) Act No 84 of 1998 and is also highly likely to occur in the study area.

Furthermore, when utilising the Plants of South Africa (http://posa.sanbi.org) an analysis of plant species previously recorded in the region includes the following protected and Red Listed species recorded:

Table 5: Protected and Red Listed species recorded for the degree square (2923) (http://posa.sanbi.org).

LC – **Least Concern** A species is Least Concern when it has been evaluated against the IUCN criteria and does not qualify for any of the above categories. Species classified as Least Concern are considered at low risk of extinction. Widespread and abundant species are typically classified in this category.

DDD – **Data Deficient** - Insufficient Information (DDD) A species is DDD when there is inadequate information to make an assessment of its risk of extinction, but the species is well defined. Listing of species in this category indicates that more information is required and that future research could show that a threatened classification is appropriate.

NT – **Near Threatened** (NT) A species is Near Threatened when available evidence indicates that it nearly meets any of the IUCN criteria for Vulnerable and is therefore likely to become at risk of extinction in the near future.

VU – **Vulnerable** (VU) A species is Vulnerable when the best available evidence indicates that it meets at least one of the five IUCN criteria for Vulnerable, indicating that the species is facing a high risk of extinction.

EN – **Endangered** (EN) A species is Endangered when the best available evidence indicates that it meets at least one of the five IUCN criteria for Endangered, indicating that the species is facing a very high risk of extinction.

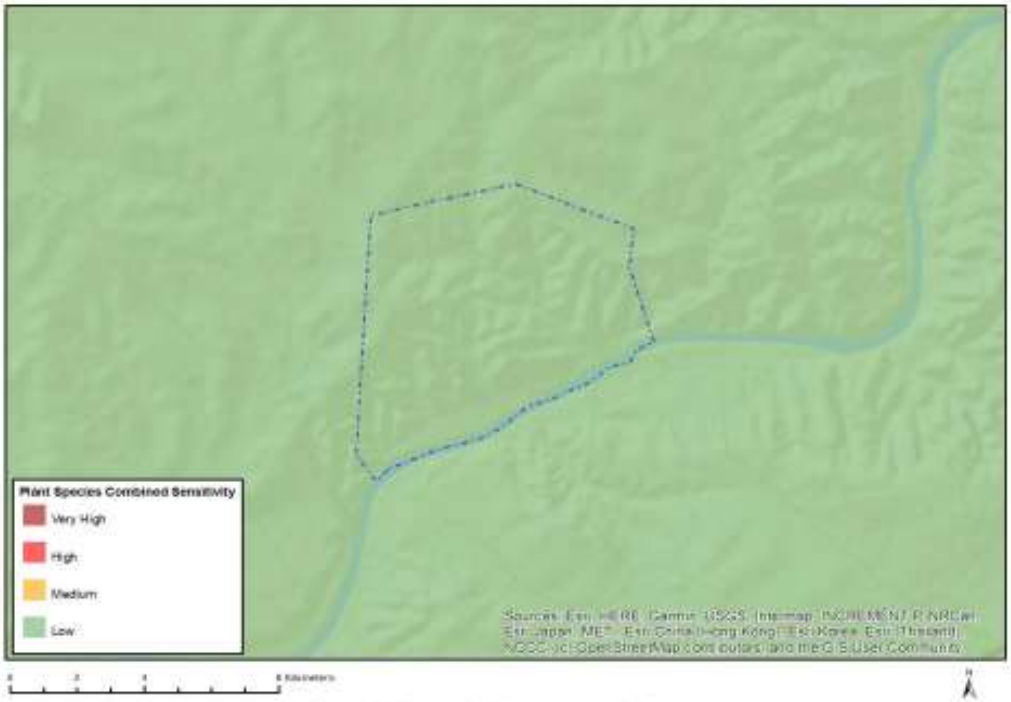
FAMILY	Scientific name	Status
AMARYLLIDACEAE	*Ammocharis coranica*	LC
AMARYLLIDACEAE	*Crinum bulbispermum*	Declining
AMARYLLIDACEAE	*Nerine laticoma*	LC
APIACEAE	*Choritaenia capensis*	LC
APIACEAE	*Deverra burchellii*	LC
APOCYNACEAE	*Fockea angustifolia*	LC
APOCYNACEAE	*Gomphocarpus fruticosus* subsp. *fruticosus*	LC
APOCYNACEAE	*Hoodia gordonii*	DDD
APOCYNACEAE	*Hoodia officinalis* subsp. *officinalis*	NT
APOCYNACEAE	*Microloma armatum* var. *armatum*	LC
APOCYNACEAE	*Orbea cooperi*	LC
ASPHODELACEAE	*Aloe claviflora*	LC
ASPHODELACEAE	*Aloe grandidentata*	LC
ASPHODELACEAE	*Aloe hereroensis* var. *hereroensis*	LC
ASPHODELACEAE	*Aloe variegata*	LC
ASPHODELACEAE	*Bulbine haworthioides*	VU
ASPHODELACEAE	*Trachyandra saltii* var. *saltii*	LC
COLCHICACEAE	*Colchicum leistneri*	LC
COLCHICACEAE	*Ornithoglossum dinteri*	LC
COMBRETACEAE	*Combretum erythrophyllum*	LC
CRASSULACEAE	*Kalanchoe rotundifolia*	LC
ERICACEAE	*Erica aspalathifolia* var. *aspalathifolia*	Declining
ERICACEAE	*Erica holtii*	LC
ERIOSPERMACEAE	*Eriospermum corymbosum*	LC
EUPHORBIACEAE	*Euphorbia bergii*	LC
EUPHORBIACEAE	*Euphorbia burmannii*	LC
EUPHORBIACEAE	*Euphorbia gariepina* subsp. *gariepina*	LC
EUPHORBIACEAE	*Euphorbia wilmaniae*	LC
FABACEAE	*Acacia erioloba*	Declining
FABACEAE	*Acacia haematoxylon*	LC
HYACINTHACEAE	*Ornithogalum flexuosum*	LC
IRIDACEAE	*Babiana bainesii*	LC
IRIDACEAE	*Duthieastrum linifolium*	LC
IRIDACEAE	*Freesia andersoniae*	LC
IRIDACEAE	*Moraea elegans*	EN
IRIDACEAE	*Moraea falcifolia*	LC
IRIDACEAE	*Moraea pallida*	LC
IRIDACEAE	*Moraea polystachya*	LC
IRIDACEAE	*Tritonia karooica*	LC
MESEMBRYANTHEMACEAE	*Lithops hookeri*	LC
MESEMBRYANTHEMACEAE	*Lithops lesliei* subsp. *burchellii*	NT
MESEMBRYANTHEMACEAE	*Mestoklema arboriforme*	LC
MESEMBRYANTHEMACEAE	*Psilocaulon articulatum*	LC
MESEMBRYANTHEMACEAE	*Psilocaulon coriarium*	LC
MESEMBRYANTHEMACEAE	*Ruschia intricata*	LC
MESEMBRYANTHEMACEAE	*Titanopsis calcarea*	LC
MESEMBRYANTHEMACEAE	*Trichodiadema pomeridianum*	LC
OLEACEAE	*Olea europaea* subsp. *africana*	LC
SCROPHULARIACEAE	*Jamesbrittenia aurantiaca*	LC
SCROPHULARIACEAE	*Jamesbrittenia integerrima*	LC
SCROPHULARIACEAE	*Jamesbrittenia racemosa*	LC
SCROPHULARIACEAE	*Jamesbrittenia tysonii*	LC
SCROPHULARIACEAE	*Limosella maior*	LC
SCROPHULARIACEAE	*Nemesia pubescens* var. *pubescens*	LC

There is a high likelihood that many of these species as listed will occur within the study area. Note also a high percentage of Red Listed species with several of high conservation significance. Furthermore, the area has been very poorly surveyed, especially in botanical terms, and therefore it is highly likely that many other protected or Red

Listed species may occur in this area (Mucina & Rutherford 2006, Van Wyk & Smith 2001).

Although the screening tool indicated a low sensitivity for flora an ecological study will be conducted as the desktop study done in June 2018 by DPR indicates a high abundance of conservation significant plant species which needs to be considered in rating impacts and to plan for mitigation measures.

MAP OF RELATIVE PLANT SPECIES THEME SENSITIVITY



Where only a sensitive plant unique number or sensitive animal unique number is provided in the screening report and an assessment is required, the environmental assessment practitioner (EAP) or specialist is required to email SANBI at eiadatarequests@sanbi.org.za listing all sensitive species with their unique identifiers for which information is required. The name has been withheld as the species may be prone to illegal harvesting and must be protected. SANBI will release the actual species name after the details of the EAP or specialist have been documented.

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low Sensitivity

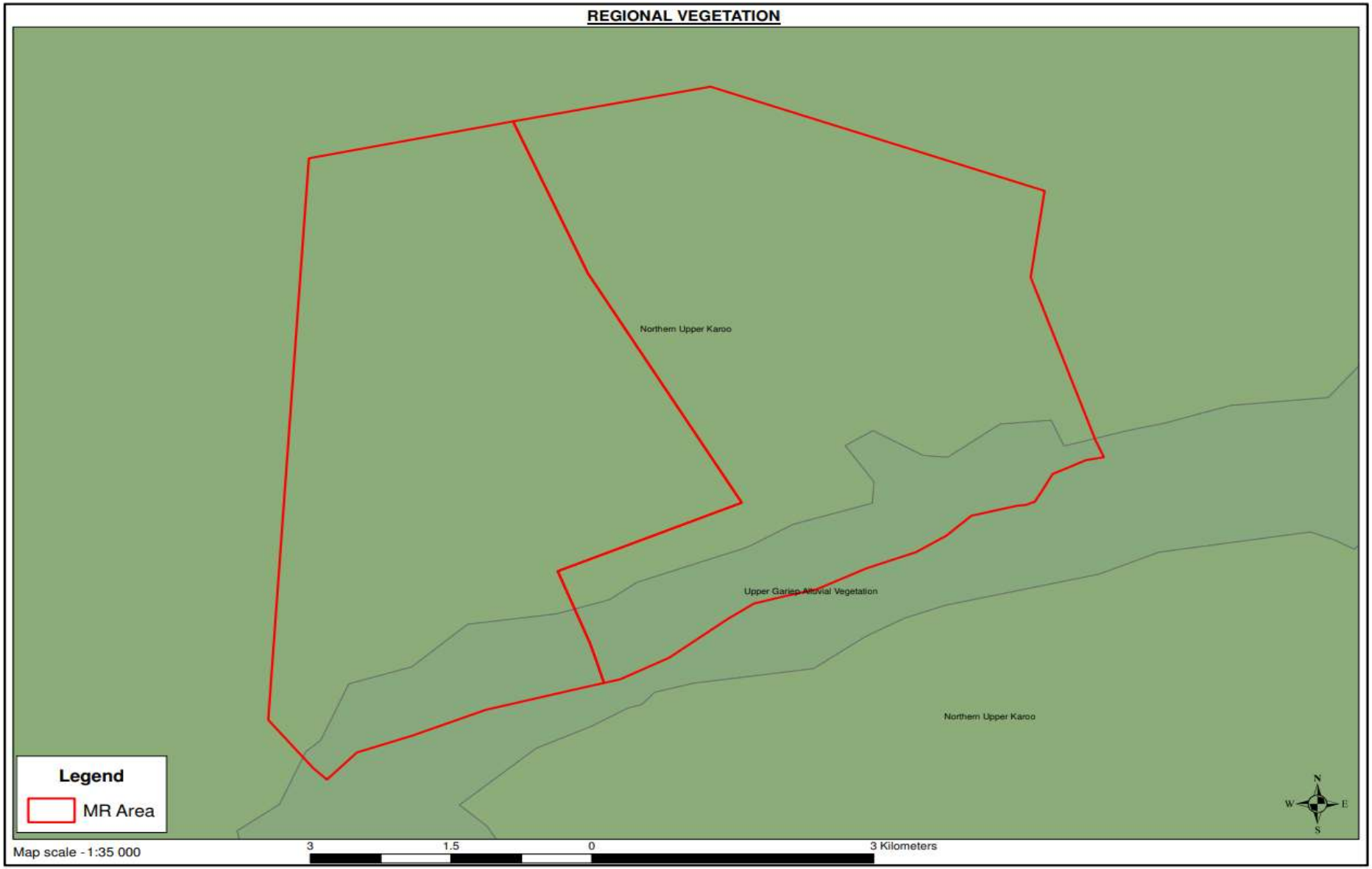


Figure 15. Regional Vegetation Map, the Mining Right application is indicated in red.

NATURAL FAUNA:

Darius van Rensburg from DPR Ecologists and Environmental Services has been appointed by Renaissance Resources to provide a Desktop Ecological and Wetland assessment in June 2018 for alluvial diamond mining prospecting on Portions 15 and 23 of the farm Lanyon Vale 376 near Douglas, and to determine the possible impact of prospecting on the application area fauna and flora was described and included in this report.

From desktop assessment the actual occurrence of fauna on the site cannot be determine but species likely to occur in the region can be determined. Owing to the natural condition of the study area and few impacts it is anticipated that a large and natural faunal population will be present. It is also highly likely that species of conservation significance will occur.

Table 6: Red Listed mammals likely to occur in the study area (Child et al 2016).

Common name	Scientific name	Status
SA hedgehog	*Erinaceus frontalis*	Near Threatened
Dent's horseshoe bat	*Rhinolopus denti*	Near Threatened
Pangolin	*Manis temminnki*	Vulnerable
Littledai's whistling rat	*Parotomys littledalei*	Near Threatened
Small spotted cat	*Felis nigripes*	Vulnerable

The proposed prospecting of the area is likely to impact on the faunal population in terms of habitat loss. The prospecting should however not result in the transformation of large areas of vegetation and the impact on fauna should likewise not be high. However, sensitive species may be affected by the increased activity and could vacate the area which would impact on population dynamics and essentially also contribute to habitat pressure.

Care should therefore be taken to ensure none of the faunal species on site is harmed. The hunting, capturing or harming in any way of mammals on the site should not be allowed.

Table 7: Likely mammal species in the region (Erasmus).

Common name	Scientific name
Reddish-grey musk shrew	*Crocidura cyaneae*
SA hedgehog	*Erinaceus frontalis*
Sclater's golden mole	*Chlorotalpa sclateri*
Round-eared elephant shrew	*Mcroscelides probiscideus*
Smith's rock elephant shrew	*Elephantulus rupestris*
Rock elephant shrew	*Elephantulus myurus*
Straw coloured fruit bat	*Eidolon helvum*
Egyptian free-tailed bat	*Taderia aegyptiaca*
Lesueur's hairy bat	*Myotis lesueuri*
Cape serotine bat	*Eptesicus capensis*
Common slit-faced bat	*Nycteris thebaica*
Geoffroy's horseshoe bat	*Rhinolopus clivosus*
Dent's horseshoe bat	*Rhinolopus denti*
Chacma baboon	*Papio ursinus*
Vervet monkey	*Cercopithecus pygerythrus*
Pangolin	*Manis temminnki*
Cape hare	*Lepus capensis*
Scrub hare	*Lepus saxatilis*
Smith's red rock rabbit	*Pronolagus rupestris*
Common molerat	*Cryptomys hottentotus*
Porcupine	*Hystrix africaeaustralis*
Springhare	*Pedetes capensis*
Spectacled mouse	*Graphiurus ocularis*
Ground squirrel	*Xerus inauris*
Brant's whistling rat	*Parotomys brantsii*
Littledai's whistling rat	*Parotomys littledalei*
Bush karroo rat	*Otomys unisulcatus*
Striped mouse	*Rhabdomys pumilio*
House mouse	*Mus musculus*
Pygmy mouse	*Mus minutoides*
Multimmmate mouse	*Praomys natalensis*
Namaqua rock mouse	*Aethomys namaquensis*
Red veld rat	*Aethomys chrysophilus*
Rock dassie	*Procavia capensis*
Klipspringer	*Oreotragus oreotragus*
Steenbok	*Raphicerus campestris*
Kudu	*Tragelaphus strepciceros*
Blesbok	*Damaliscus dorcas phillipsi*

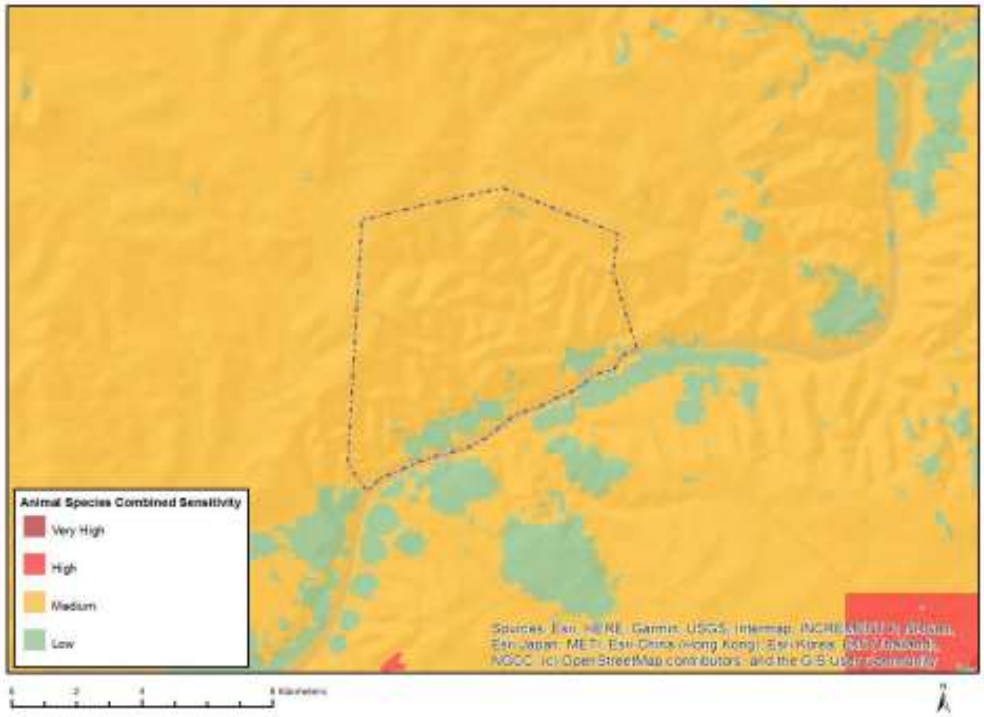
House rat	*Rattus rattus*
Short-tailed gerbil	*Desmodilus auricularis*
Hairy-foot gerbil	*Gerbillurus paeba*
Bushveld gerbil	*Tatera leucogaster*
Highveld gerbil	*Tatera brantsii*
Pouched mouse	*Saccostomus campestris*
Large-eared mouse	*Melacothrix typica*
Aardwolf	*Proteles cristatus*
Caracal	*Felis caracal*
African wild cat	*Cape Felis sylvestris*
Small spotted cat	*Felis nigripes*
Bat-eared fox	*Otocyon megalotis*
Cape fox	*Vulpes chama*
Black-backed jackal	*Canis mesomelas*
Cape clawless otter	*Aonys capensis*
Honey badger	*Mellivora capensis*
Striped polecate	*Ictonyx striatus*
Small-spotted genet	*Genetta genetta*
Suricate	*Suricata suricatta*
Yellow mongoose	*Cynictis penicellata*
Slender mongoose	*Galerella sanguinea*
Small grey mongoose	*Galerella pulverulenta*
Water mongoose	*Atilax paludinosus*
Aardvark	*Orycteropus afer*

No species is limited to this site only, with most of them being generalist and having a wide distribution range. However, reasonable measure must be put in place to protect endangered and protected species if they are encountered on this site.

The mobility and in many case the adaptability of many bird species has meant that they more than any other vertebrate group have taken advantage of many of the changes we have brought about in the environment.

As this site and the fact that this area is close to the river there is a possibility that some habitats can be destroyed although most wildlife will probably immigrate to adjacent undisturbed land.

MAP OF RELATIVE ANIMAL SPECIES THEME SENSITIVITY



Where only a sensitive plant unique number or sensitive animal unique number is provided in the screening report and an assessment is required, the environmental assessment practitioner (EAP) or specialist is required to email SANBI at eiadatarequests@sanbi.org.za listing all sensitive species with their unique identifiers for which information is required. The name has been withheld as the species may be prone to illegal harvesting and must be protected. SANBI will release the actual species name after the details of the EAP or specialist have been documented.

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
		X	

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low sensitivity
Medium	Aves-Neotis ludwigii

(8) Hydrology

Surface Hydrology

Darius van Rensburg from DPR Ecologists and Environmental Services has been appointed by Renaissance Resources to provide a Desktop Ecological and Wetland assessment in June 2018 for alluvial diamond mining prospecting on Portions 15 and 23 of the farm Lanyon Vale 376 near Douglas, and to determine the possible impact of prospecting on the application area surface water was described and included in this report.

The study area consists of the entire diamond prospecting area (Map 1). From available aerial images and current mapping resources it is clear that the study area contains a very high number of watercourses including streams, drainage lines and the Orange River. It is however not possible from a desktop

assessment perspective to determine if wetland conditions are present in these and therefore they must all be assumed to contain wetland conditions.

From previous studies in the immediate surrounding areas (Oosthuizen et al 2015, Van Rensburg 2015, 2016) it is clear that streams, drainage lines and small pans occur in the area which clearly contain wetland conditions.

From these studies it is clear that the watercourses in the area are mostly seasonal in nature, only flowing after sufficient rainfall.

The larger and more significant streams contain vegetation which are readily identified as riparian vegetation. Tree species along the streams are characteristic of watercourses in these arid areas. These species include Vachellia karroo (Sweetthorn), Ziziphus mucronata (Buffalo Thorn), Searsia lancea (Karree) and Diospyros lycioides (Bluebush). Seasonal pools also occur within the streams and here wetlands have formed. Obligate wetland vegetation are present here and soil samples also indicate wetland conditions. It can therefore with relative certainty be assumed that the larger streams in the study area will have a similar appearance and will therefore contain wetland conditions.

The smaller drainage lines of which a multitude also clearly occur in the study area drain into the larger seasonal streams in the area. Vegetation along the main channel of the drainage lines do not consist of riparian or wetland species. These drainage lines therefore cannot be considered as wetland areas. The catchment of the drainage lines are small and runoff drains quickly downslope and this prevents the formation of wetland conditions. The drainage lines are nonetheless still considered sensitive and contributing to main channel flow of the largeradjacent seasonal streams. The drainage lines must still be considered as watercourses as it is clear that surface runoff and flow after rainfall events does occur within the drainage lines and therefore fits the definition of a watercourse. It is considered highly likely that this will also be the case in the study area though some variation is highly likely to occur.

Small pan systems are also common in the area and although large pan systems are clearly visible from aerial images, smaller pans will not be visible or indicated in mapping resources. Previous studies has also indicated the presence of numerous such small pan systems. These endorheic pans are well defined, natural, shallow, circular to oval depressions with no outlet, which are semi-permanently or periodically filled with water and occur in areas of less than 500 mm mean annual precipitation. Many of these pans dry up seasonally, mainly through loss of water by evaporation and they often have highly saline soils and contain high concentrations of sodium chloride and sulphates of sodium, calcium and magnesium. Although few vegetation studies have been done on pans, they are of ecological importance as part of the broader landscape of arid regions and of further ecological interest for their own biota, specifically during the periods that they hold water, and because of the briefness of those periods and the limited availability of water.

Previous studies have also indicated the presence of extensive wetland areas adjacent to the Orange River and associated with the floodplain of the river.

From these studies the wetland conditions and floodplain of the river varies greatly in terms of geomorphology and the following should give a general description of the conditions which may occur in the study area. The river bank may vary from narrow and steep to areas where alluvial fans occur within the lower zone and represent more substantive wetland areas next to the river. Areas along bends in the river contain a more substantive floodplain being formed on the inside of the bends. Deposition of material take place in these areas and form a much larger wetland area. The majority of the wetlands associated with the Orange River are however narrow and not extensive. The marginal zone is indicative of a permanent zone of wetness while the lower zone is indicative of a seasonal zone of wetness. The Orange River and its banks are clearly defined and easily identifiable although the boundary of the floodplain is not clearly defined. The riparian trees along the river bank also clearly indicate the riparian zone of the river. The floodplain of the river is however extensive and indicates the border of the riparian zone.

According to Kleynhans (2000) the Orange River in the vicinity of the study area has a PES of Category C: Moderately Modified. This is considered a relatively accurate determination of the condition of the river in the immediate area. In order to substantiate this a previous study (Van Rensburg 2016) in the immediate vicinity of the study area can be utilised to provide a relatively accurate description of the Orange River at the site.

Impacts which affect the river at the study area, surroundings as well as upstream sections include the following.

The flood dynamics of the river has been altered to a large degree by the construction of large dams upstream. Extensive alluvial diamond mining is taking place within the catchment as well as the riparian zone. This will undoubtedly contribute to the sediment load of the river. Extensive centre-pivot irrigation takes place in close proximity to the river which undoubtedly contribute to fertiliser runoff and enrichment, pesticides and other impacts associated with commercial irrigation. The study area is not utilised for stock farming although upstream and catchment is utilised for livestock farming. The construction of large containment dams such as the Vanderkloof- and Gariep Dams has influenced the frequency and magnitude of flooding which is part of the natural system. As a result thereof the flooding of the floodplain within the upper zone does no longer take place at the same regular intervals and magnitude. The floodplain within the upper zone of the river is now more dependent on surface runoff.

Diversity of plant species along the Orange River and associated floodplain is considered moderate. The marginal, lower and upper zones are considered to be largely natural with few impacts occurring in the study area in these areas although the interior of the area is affected by large-scale mining operations. The alterations and impacts upstream of the site are considered responsible for the highest transformation of ecological function of the river itself within the study area although the mining operations nearby will undoubtedly also contribute to impacts such as sediment runoff and affected seasonal streams and drainage lines feeding into the river.

The Orange River and its associated floodplains are considered a fifth order watercourse. This is also due to the Orange River being a large lowland river. The quaternary catchment of this area is D71C. An Index of Habitat Integrity (IHI) conducted along the Orange River in an adjacent area is included to provide a relatively accurate estimation of the condition of the Orange River within the study area. The results of the IHI indicated that the Orange River has an Inseam IHI of category C: Moderately Modified and Riparian IHI of category C/D: Moderately to Largely Modified.

According to Kleynhans (2000) larger seasonal streams in the surrounding area such as the Lanyon Stream and Withoekskloof have a PES ranging from Category B: Largely Natural to Category C: Moderately Modified. From aerial images no obvious and significant impacts on the streams within the study area is evident and it is therefore considered most likely that they will have a PES of Category B: Largely Natural. In addition, all of the watercourses in this area are listed as National Freshwater Ecosystems Priority Areas (NFEPA): Upstream FEPA's. This entails a high conservation value and level of sensitivity.

According to Nel et al (2011) the majority of pans and wetland areas in the area has a PES ranging from Category AB: Natural to Largely Natural to Category C: Moderately Modified.

Geohydrology

Groundwater flow is in the direction of the Orange River following the surface drainage direction from the hills in the west towards the lowlands and floodplains in the east.

The aquifers found on Wouterspan can be classified as minor aquifers with no regional importance.

Mean Depth of Water-Table

The mean depth of the water table during summer is approximately 120 m and during winters 140 m.

The quality of ground water is generally good although it does tend be brackish (mineralised) water in the drier areas.

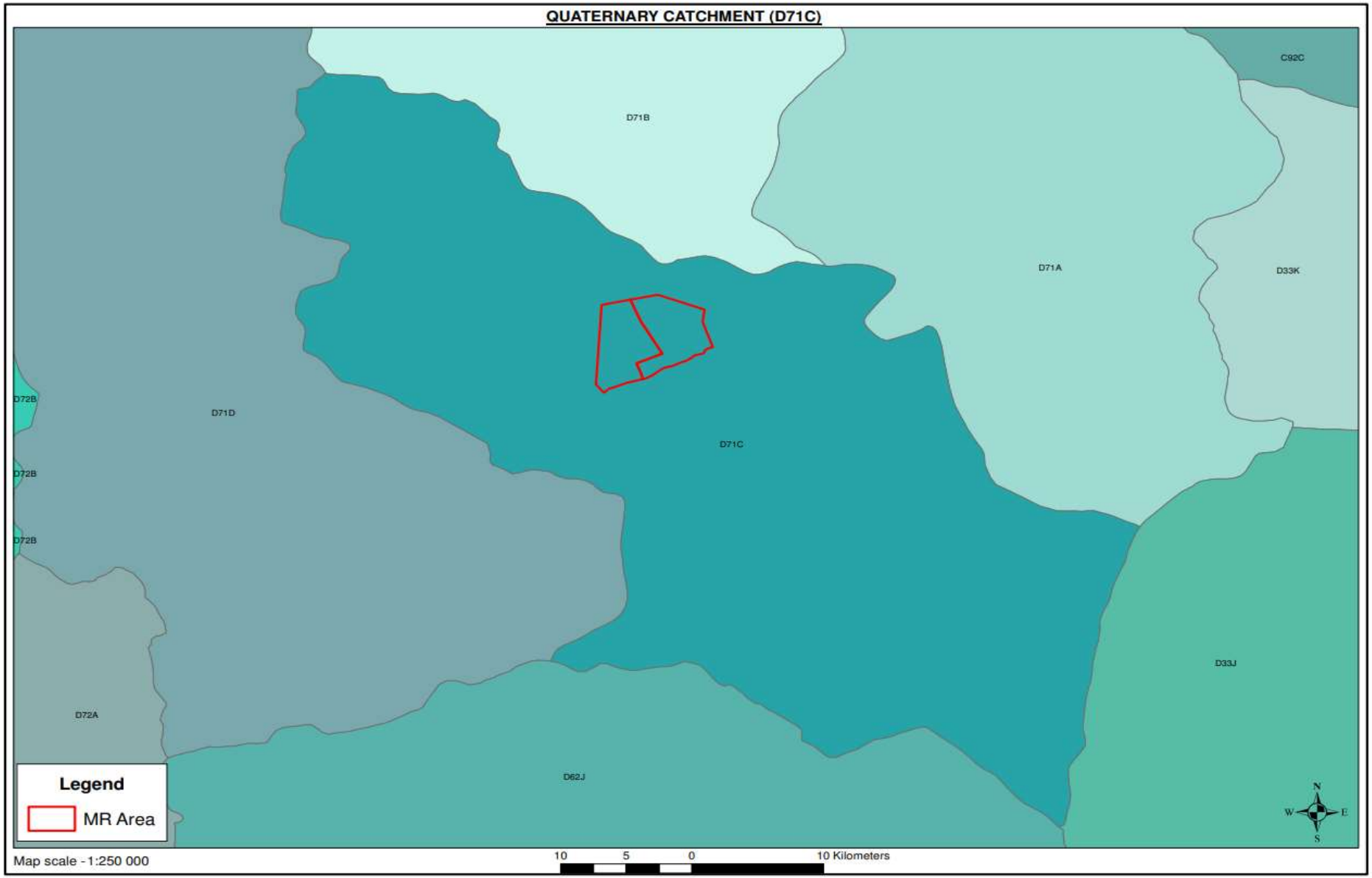


Figure 16. Quaternary Catchment Map

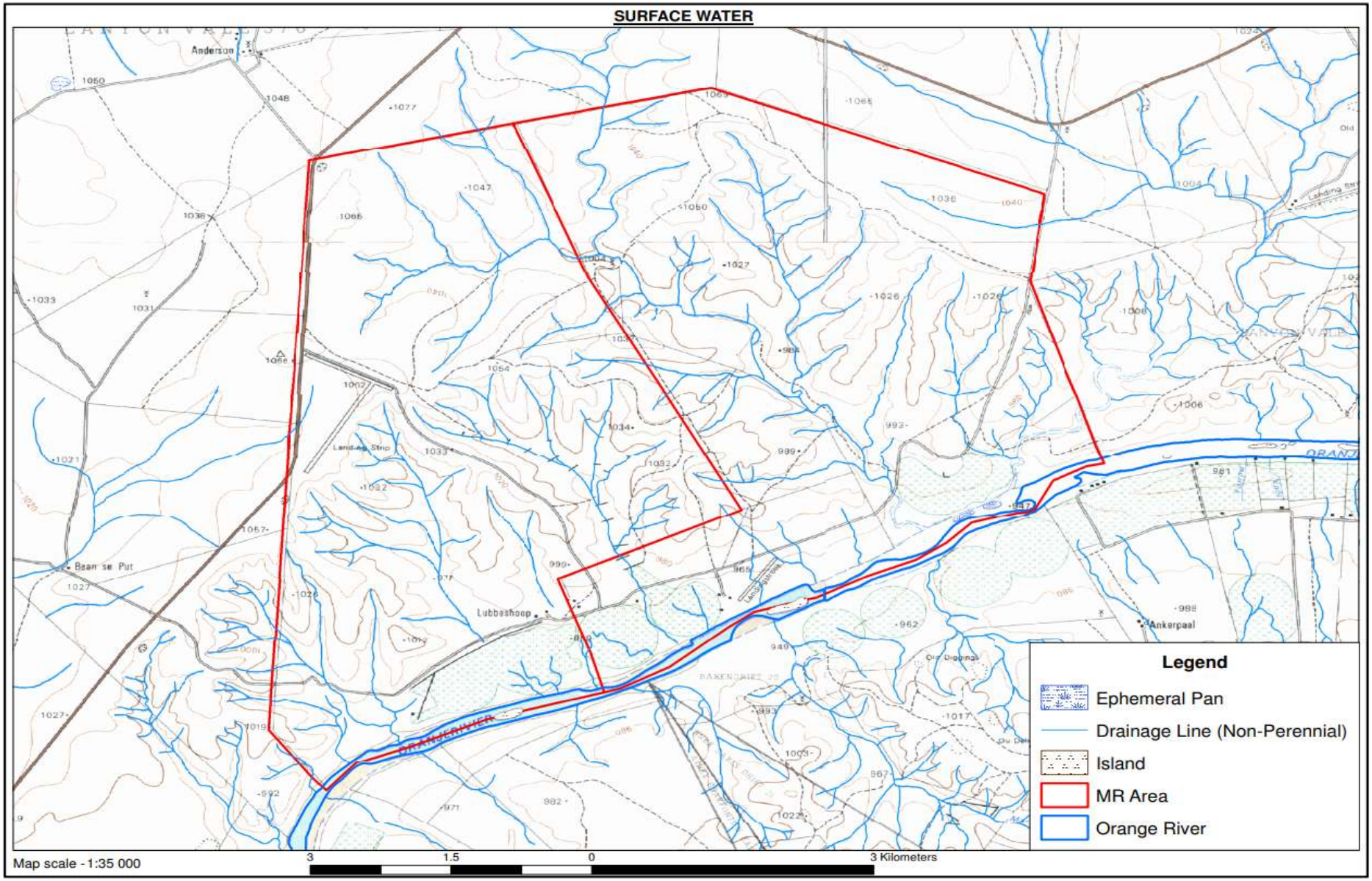


Figure 17. Surface Water Map

(9) Sites of Archeaological and Cultural Interest

In terms of section 38 of the National Heritage Resources Act, 1999 (Act No. 25 of 1999), a Phase 1 Archaeological Impact Assessment must be undertaken.

The study must be undertaken in order to establish if any localities of heritage significance are present on the property.

In terms of Palaeontology the farms is indicated as High sensitivity and a Palaeontological study will also be done.

(10) Air Quality

With reference to the Scheduled Processes under the Second Schedule to the Atmospheric Pollution Prevention Act, 1965 (Act No. 45 of 1965), no scheduled process relates to any proposed mining activtiy.

Existing Sources

The current source of air pollution in the area stems from numerous mining operations along the Orange River and from vehicles traveling on the gravel roads of the area. Farming activity, especially ploughing of the irrigation fields, may generate dust during certain periods of the year.

New Source

The source of air pollution on the farm will be nuisance dust generated by the opencast mining process, the loading of gravels onto the transport trucks, the dumping of gravels over each sites primary screen or feeder bins as well as from the movement of trucks and vehicles on the mining roads. Gas emissions from machinery will be kept within legal limits.

Areas of Impact

The prevailing wind (occasionally slightly) is from the east (June & October) and the south-west (October - January) but the strongest winds are from the north-west. The average monthly wind speeds are generally below 6.3 m/s.
There is a potential for fall-out dust to impact on the surrounding farm properties – which can be described as the nearest potential area of impact. The dust management programme recommended should include daily dosing of access roads and stockpile areas.

If dust is generated, it is expected to be visible from the surrounding farmland or mines along the Orange River.

(11) Noise

Noise on site will come from the large vehicles (tip trucks, front-end loaders, back actors), from the working pans.

(12) VISUAL ASPECTS:

The mining site on Lanyon Vale will not be visible from any National Roads, but could be visible from the gravel road that runs next to the farm and through the farm.

The negative visual impacts associated with open excavations and the washing pans will however have a negative impact since it will be visible to the landowners. There is however no method of reducing the impact during mining operations (operational phase), it can only be mitigation done by doing concurrent rehabilitation of open excavations as mining progress.

(13) BROAD-SCALE ECOLOGICAL PROCESSES:

Transformation of intact habitat on a cumulative basis could contribute to the fragmentation of the landscape and could potentially disrupt the connectivity of the landscape for fauna and flora and impair their ability to respond to environmental fluctuations. The sites had been indicated on the screening tool as having high sensitivity in terms of broad scale ecology. A specialist ecological study will be conducted and included into the EIA EMP document.

(14) SOCIO-ECONOMIC STRUCTURE OF THE REGION:

The Northern Cape is geographically the largest province in South Africa having a land mass of 373,239 km² and covers approximately one third of the country's surface area. It is bordered by the Atlantic Ocean on the west, Namibia on the northwest and Botswana on the north, the Western Cape on the southwest and the Free State on the east.

The Northern Cape is the largest and most sparsely populated province of South Africa. It was created in 1994 when the Cape Province was split up. The Orange River flows through the province, forming the borders with the Free State in the southeast and with Namibia to the northwest. The Orange and Vaal Rivers meet in Douglas at the confluence and are used to irrigate the many agricultural farming activities in and around Douglas.

Figure 18. Locality Map of Northern Cape. Source: Google Maps (2020)

The demarcation process of 2000 resulted in five district municipalities (ZF Mgcawu DM, John Taolo Gaetsewe DM, Namaqua DM, Francis Baard DM and Pixley ka Seme DM) together comprising twenty-seven Category B municipalities.

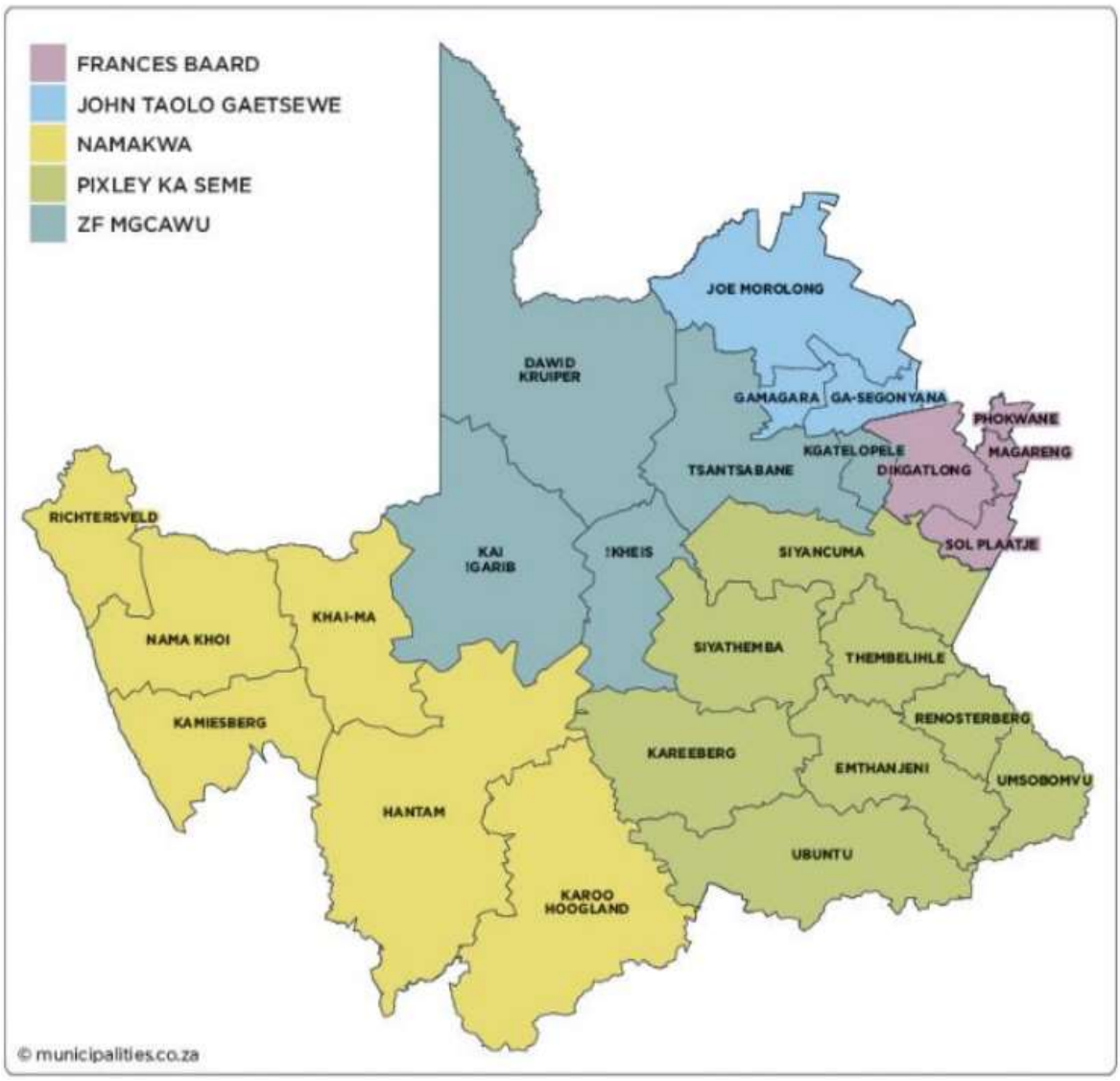


Figure 19. Map of District Municipalities in the Northern Cape. Source: Google Maps (2020)

The Siyancuma Local Municipality is situated within the Pixley Ka Seme DM of the Northern Cape Province. It is bordered by the ZF Mgcawu DM in the north and west, Frances Baard DM in the north, Siyathemba LM and Thembelihle LM in the south, and the Free State Province in the east.

The local area (Siyancuma) has a small to medium population density and labour is sourced from the surrounding towns of Prieska and Douglas. Fuel and basic supplies can be obtained at Douglas or Prieska and the property has land and mobile telephone connectivity.

The following information is found in the Integrated Development Plan (IDP) 2020 – 2021 of the Siyancuma Municipality.

The Siyancuma Local Municipality hosts the confluence of the Vaal and the Orange River. It comprises in the main of the three towns, that is, Campbell, Douglas and Griekwastad and has densely populated rural settlements called

Smitchdrift and Bucklands. The municipal area is richly endowed with precious and semi-precious stones, that is, diamonds and tiger's eye. Beneficiation of tiger's eye is on the high impact project identified in the District Growth and Development Strategy. The Municipality has a great tourism potential.

The Siyancuma Local Municipality is characterised by incorporating the confluence of South Africa's largest rivers, the Orange and Vaal Rivers, with rich mineral deposits (diamonds, tiger's eye, zinc, lead and copper). The municipality has relatively high levels of basic services, partially integrated society, medical facilities in Douglas and Griekwastad, one of the biggest correctional services in the province and is the neighbour to Kimberley, the provincial and legislative capital of the province. It still has major inequalities to overcome and in common with the rest of the country, a skew and sluggish economy to transform and speed up. The themes of this IDP are increasing economic growth, improving community self-reliance, achieving service excellence and sustainability led by strengthened leadership and good governance and a common approach between stakeholders.

Population

Pixley ka Seme District Municipality has the third largest population in the Northern Cape and shows a slight increase of 9244 from 2011 to 2016. It represents 28,41 % of the Northern Cape population. The table and graph below depict the population figures of the five District Municipalities as in 2011 and 2016:

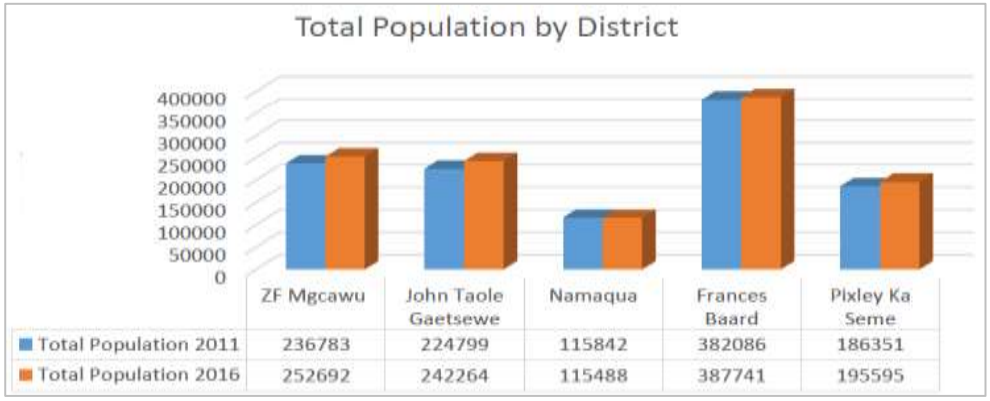


Figure 20: Total Population by District (Source: StatsSA (2011) & StatsSA Community Survey (2016))

From 2001 to 2011, the total population for Siyancuma Local Municipality showed a negative growth rate of -5.6% with the population decreasing from 39 275 to 37 076 (StatsSA 2011). A further negative growth rate of -3.1% was experienced from 2011 to 2016 when the population decreased from 37 076 to 35 938 (Community Survey 2016).

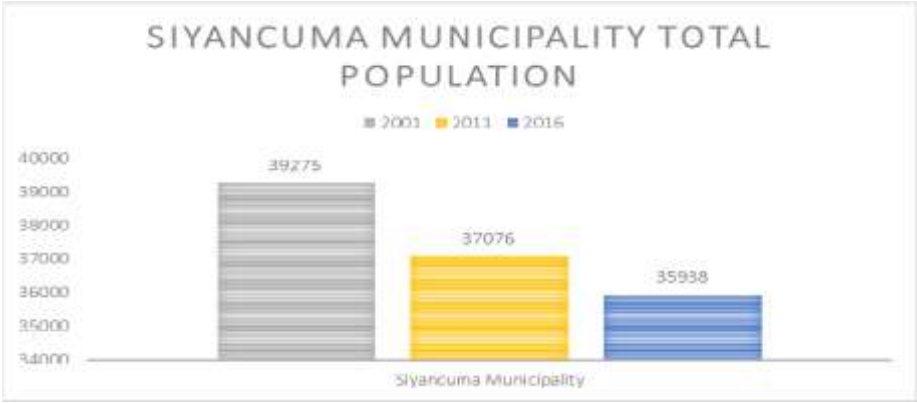
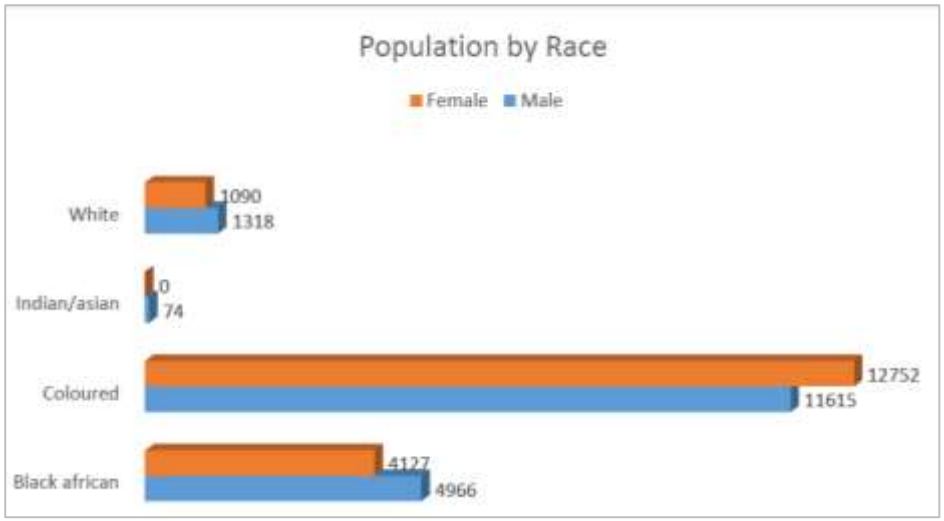
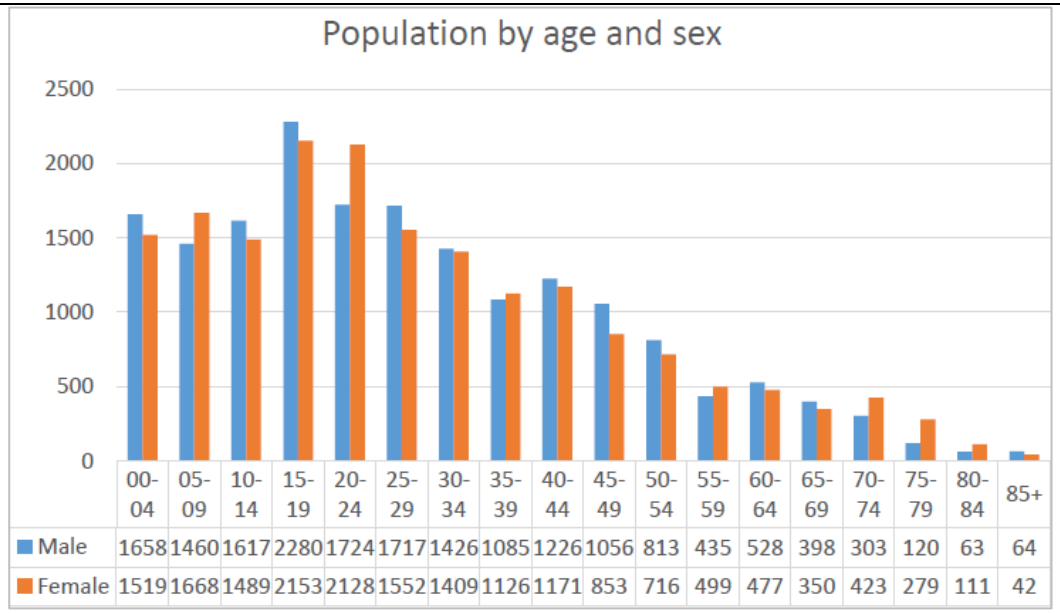


Figure 21: Siyancuma Municipality total population (Source: (2001), StatsSA (2011) & StatsSA Community Survey (2016)).
The Siyancuma Municipality's total population of 35 938 (2016) can be broken down as follows:

	• Coloured – 67,80 % • African – 25,30 % • White – 6,69 % • Asian – 0,21 % The overall sex ratio (male : female) is more or less 50:50, although it is 48:52 for Coloureds meaning that there are slightly more Coloured females than males.  Figure 22: Population by race and gender (Source: StatsSA Community Survey (2016)).
Age & Gender Composition	Demographic information from the 2016 Community Survey structured the Siyancuma total population as follow: • Population under 15: 26,2 % • Population 15 to 64: 67,8 % • Population over 64: 6,0 %



	00-04	05-09	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
Male	1658	1460	1617	2280	1724	1717	1426	1085	1226	1056	813	435	528	398	303	120	63	64
Female	1519	1668	1489	2153	2128	1552	1409	1126	1171	853	716	499	477	350	423	279	111	42

Figure 23: Population by age and gender.

It is further evident from the information in the graph that:

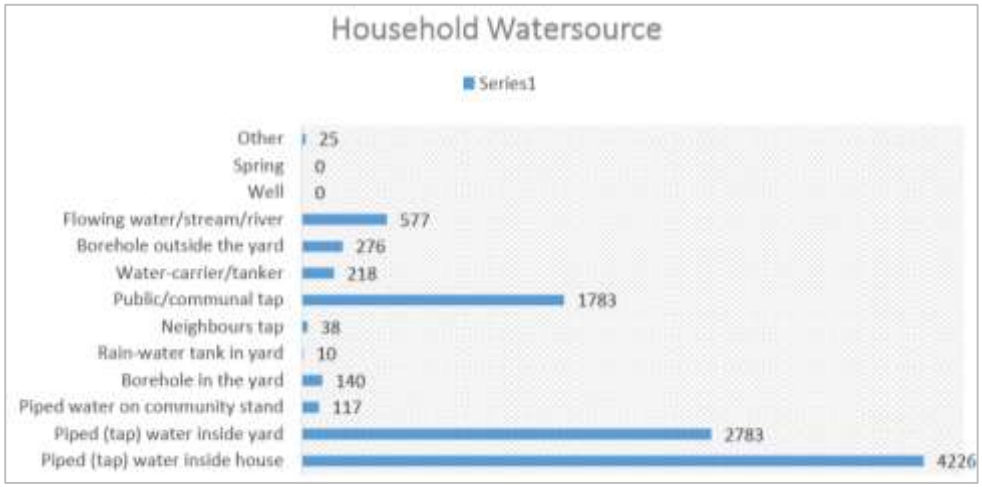
- age group 15 – 19 is the highest. This group represents education grades 9 – 12, and forms 12,4 % of the total population.
- age group 20 – 34 represents the youth component and forms 27,7 % of the total population. This group characterises the economically active group and will have an impact on the employment and income levels within the municipality.
- from age 70, the mortality rate is higher for males than for females.

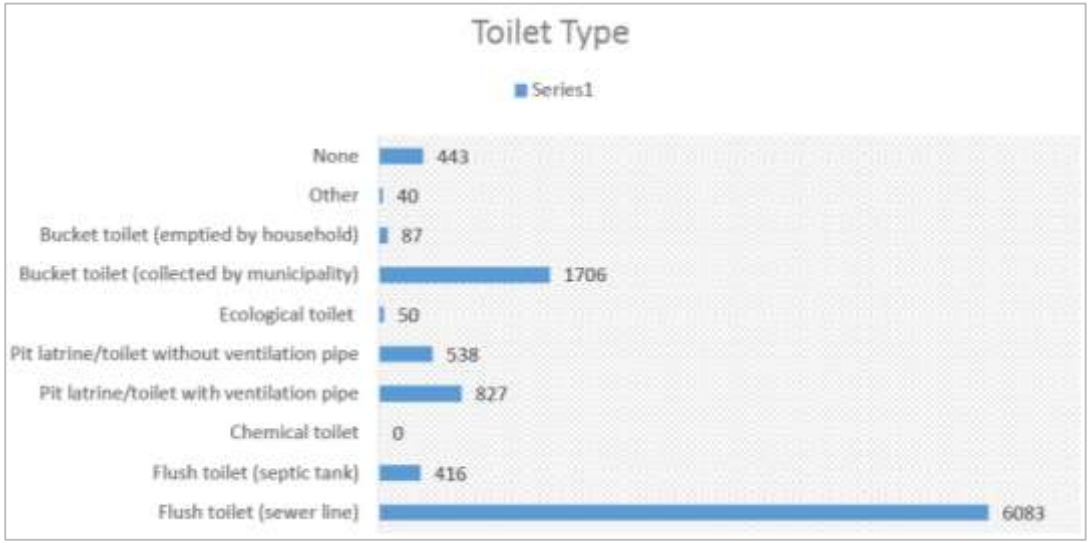
Health overview

The sectoral approach that was adopted to analyse the present health facilities of the Pixley Ka Seme district revealed that the National Government has adopted a primary health care strategy that includes making such services available within walking distance of communities. The strategy also includes improvement in sanitation and drinking water supply, etc. Thus the health care systems that presently exist in the District consist of:

- District Hospitals
- Community Healthcare Centres

Table 8: Municipal Health Centres (Source: Siyancuma Municipality (2020))

	<table><tr><th>TOWNS</th><th>HOSPITALS/ CHC's</th><th>CLINICS</th></tr><tr><td>Schmidsdrift</td><td>-</td><td>1</td></tr><tr><td>Campbell</td><td>-</td><td>1</td></tr><tr><td>Griekwastad</td><td>1</td><td>1</td></tr><tr><td>Douglas</td><td>1</td><td>2</td></tr><tr><td>TOTAL</td><td>2</td><td>5</td></tr></table>
Water	Most households in the Siyancuma Local Municipality area have access to water inside the house followed by taps inside the yard. However, many households are still dependant on communal taps.  Figure 24: Household Water sources (Source: StatsSA Community Survey (2016)).
Sanitation	Sewerage and sanitation are basic needs of communities which can pose serious health and hygiene risks for communities and the environment at large if not properly managed and monitored. According to the White Paper on Basic Household Sanitation, 2001, basic sanitation is defined as: "The minimum acceptable basic level of sanitation is: (a) Appropriate health and hygiene awareness and behaviour;

	(b) A system for disposing of human excreta, household waste water ad refuse, which is acceptable and affordable to the users, safe, hygienic and easily accessible and which does not have an unacceptable impact on the environmental and (c) A toilet facility for each household" From the graph above the majority of toilets (6083) are flush toilets, followed by bucket toilets (1706) which are still being collected by the municipality.  Figure 25: Toilet Type (Source: StatsSA Community Survey (2016)).
Refuse Removal	The graph below illustrates that refuse is being removed at least once a week, to the tune of 7323 households. However, a substantial number of people are still dumping domestic and garden waste on illegal dumping sites. This poses a serious environmental and health risk/hazard. Communal dumping sites are not registered and licensed at the moment and efforts are underway to get them licensed.

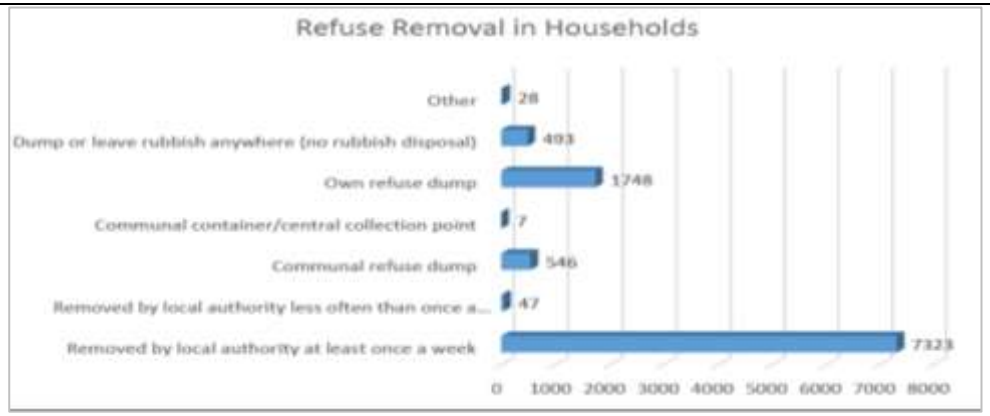


Figure 26: Refuse removal (Source: StatsSA Community Survey (2016))

Electricity

Siyancuma Local Municipality is currently facing a big challenge in terms of electricity bulk supply due to the expansion of informal areas. Another challenge is the fact that electrical infrastructure, e.g., transformers, are dilapidated and need to be repaired or replaced at very high costs.

According to the Community Survey of 2016, most households (7381) are using in-house prepaid meters, followed by in-house conventional meters (1334). A new trend is taking root where people are installing solar home systems, and 357 such systems were already installed in 2016.

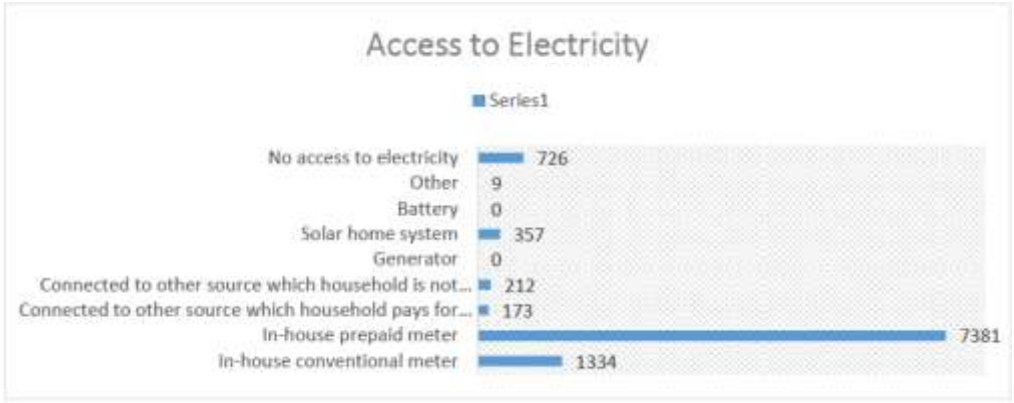


Figure 27: Access to Electricity (Source: StatsSA Community Survey (2016))

Housing

1. Household Dynamics

The table below indicates that the number of households in the Siyancuma Municipality have increased by 613 number of households from 2011 to 2016. It can also be seen that the number of formal dwellings have increased along with the number of houses being owned by their residents.

Table 9: Household Dynamics (Source: StatsSA Community Survey (2016) and StatsSA (2011))

	2016	2011
Number of Households	10 191	9578
Average household size	3,5	3,8
Female headed households	36,4 %	35,7 %
Formal dwellings	82,0 %	73,0 %
Housing owned	50,3 %	39,6 %

2. Household Services

From the table below it can be seen that the services provided to households within the Siyancuma Municipality have improved. More households indicated that they have flush toilets, refuse removal, piped water (inside dwellings) and electricity in 2016 than in 2011.

Table 10: Household services (Source: StatsSA Community Survey (2016) and StatsSA (2011))

	2016	2011
Flush toilet connected to sewerage	59,7 %	53,4 %
Weekly refuse removal	71,9 %	62,3 %
Piped water inside dwelling	41,5 %	41,4 %
Electricity for lighting	89,1 %	82,2 %

3. Housing Backlogs

From the figure below it can be seen that the total housing backlogs amount up to 3345 houses with the greatest backlog being in the town Breipaal (1051 houses) followed by Bongani (836 houses) and Schmidtsdrift (700 houses).

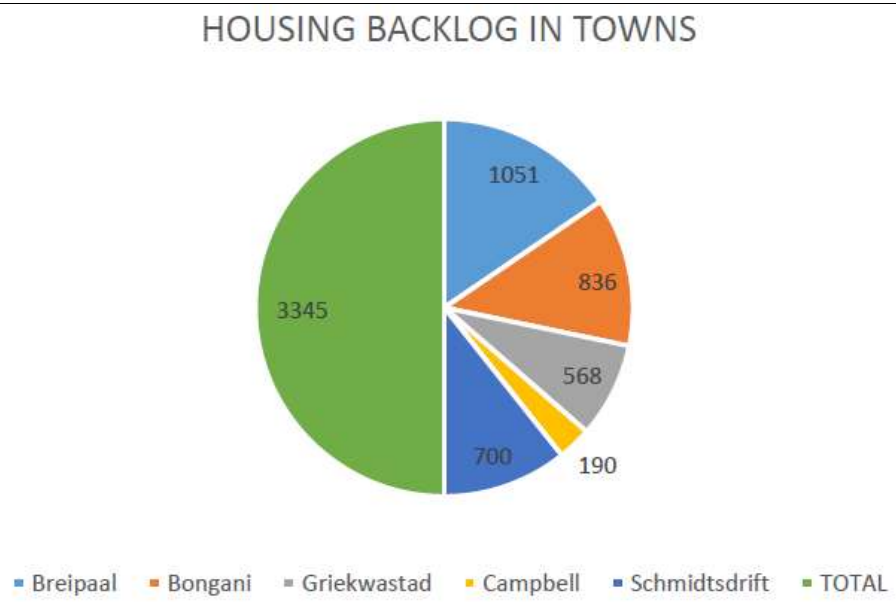


Figure 28: Housing Backlog in towns (Source: Siyancuma Local Municipality (2020)).

Education

1. Level of Education:
The statistics below represent the level of education of the population above the age of 20. It is of significance, because it shows an increase in matric and higher education qualifications of 3,6% and 3,5% respectively from 2011 to 2016, while the figure for people with no schooling decreases with 7,0%. This represents a positive improvement in terms of increasing the levels of literacy within the municipality.

Table 11: Level of education (age +20) (Source: StatSA Community Survey (2016) and StatsSA (2011))

	2016	2011
No schooling	9,7 %	16,7 %
Matric	20,4 %	16,8 %
Higher education	8,9 %	5,4 %

2. Education by sex

The graph below illustrates that more females (7369) than males (6979) completed grades 9 to 12, while slightly more males (1134) than females (1123) have a post matric qualification. People with no schooling stood at 2483 females and 2642 males in 2016, which is 14,2 % of the total population.

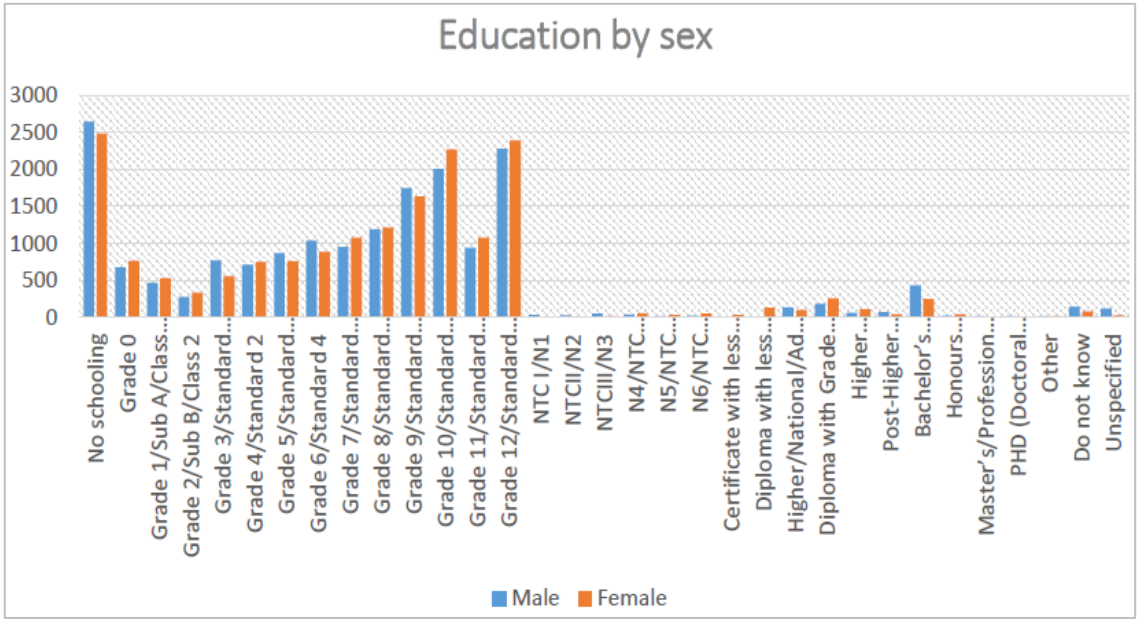


Figure 29: Education by gender.

(15) *SENSITIVE LANDSCAPES:*

"Sensitive Environments" that have statutory protection are the following:-

1. Limited development areas (Section 23 of the Environmental Conservation Act, 1989 (Act 73 of 1989).
2. Protected natural environments and national heritage sites.
3. National, provincial, municipal and private nature reserves.
4. Conservation areas and sites of conservation significance.
5. National monuments and gardens of rememberance.
6. **Archaeological and palaeontolocial sites.**
7. Graves and burial sites.
8. Lake areas, offshore islands and the admirality reserve.
9. Estuaries, lagoons, wetlands and lakes.
10. **Streams and river channels and their banks.**
11. Dunes and beaches.
12. Caves and sites of geological significance.
13. Battle and burial sites.
14. Habitat and/or breeding sites of Red Data Book species.
15. Areas or sites of outstanding natural beauty.
16. Areas or sites of special scientific interest.
17. Areas or sites of special social, cultural or historical interest.
18. Declared national heritage sites.
19. Mountain catchment areas.
20. Areas with eco-tourism potential.

The relevant specialists will be appointed to assess whether there are any sensitive landscapes within the applicationa area.

(b) Description of the Current Land Use

(1) *Land Use before Mining:*

The current land uses of the project area and surroundings can be best described as agricultural lands, livestock and/or game farming and mining in the district.

(2) Evidence of Disturbance:-

As previously mentioned the entire study area seems to consist of natural vegetation with few impacts present. The current landuse is most likely associated with farming activities.
Associated with this can be discerned a sparse network of gravel roads and dirt tracks, a farmstead associated with a few buildings and five

centre-pivot irrigation areas. The latter considered to be the most prominent impact in the study area (DPR, June 2018).

(1) Existing Structures:-

Specific environmental features and / or infrastructure occur on site or within close proximity include:

- Agricultural lands
- Farm buildings
- Landing strip
- Orange river
- Water boreholes

All 100m safety borders from formal infrastructure will be kept.

(c) Description of Specific Environmental Features and Infrastructure on Site

The infrastructure on site comprehensively discussed in section d(ii) as part of the mining methodology discussion, as well as in section g as part of the mine footprint description. Furthermore, a comprehensive description of the environment was presented in section (i) as part of the baseline report.

(d) Environmental and current land use map

(Show all environmental, and current land use features)

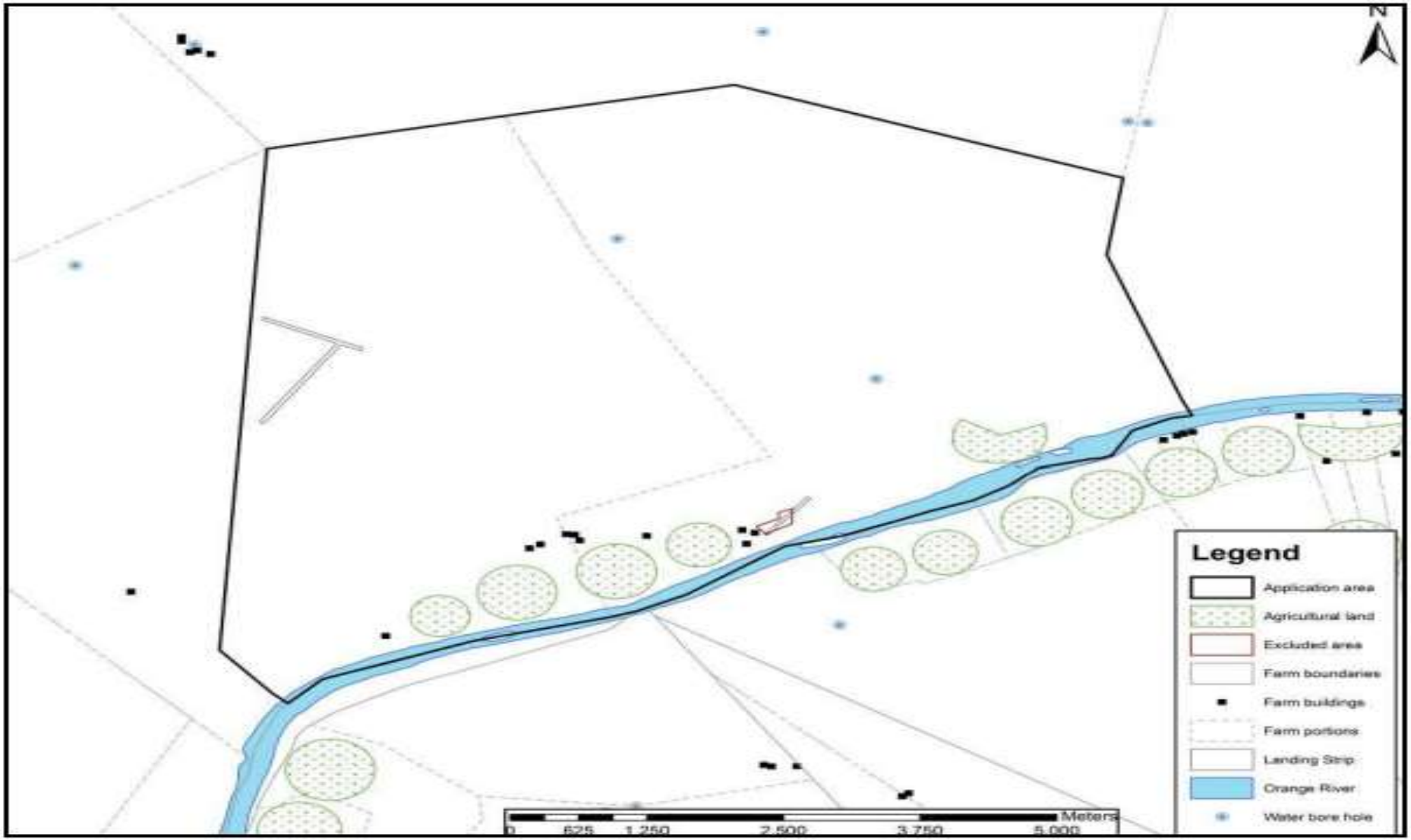


Figure 30. Environmental and current land use map

v) Impacts identified

(Provide a list of the potential impacts identified of the activities described in the initial site layout that will be undertaken, as informed by both the typical known impacts of such activities, and as informed by the consultations with affected parties together with the significance, probability and duration of the impacts.)

Nature of Impact	Significance	Probability	Duration
Sterilisation of mineral resources.	Very low	Highly unlikely	Decommissioning
Changes to surface topography due to topsoil removal, alluvial mining, placement of infrastructure and development of residue deposits.	Low to Medium	Certain	Long Term Life of operation
Soil erosion by water and wind on disturbed and exposed soils; potential for dust production and soil microbial degradation; potential contamination of soils due to spillages.	Low to Medium	Possible	Long Term Life of operation
Loss of land capability through topsoil removal, disturbances and loss of soil fertility.	Very low	Possible	Short term
Loss of land use due to poor placement of surface infrastructure and ineffective rehabilitation.	Very low	Possible	Short term
Pollution of underground water sources.	Low	Possible	Long Term Residual
Deterioration of water resources through alluvial mining.	Medium to High	Possible	Long Term Residual
Deterioration in water quality through spillages and runoff from sites.	Medium to high	Possible	Long Term Life of operation
The clearance of vegetation; potential loss of floral species with conservation value; potential loss of ecosystem function.	Low to Medium	Certain	Long Term Life of operation
Proliferation of alien invasive plants species.	Low to Medium	Possible	Long Term Residual
Displacement of faunal species.	Low	Possible	Long Term Life of operation
The loss, damage and fragmentation of floral and faunal habitats; potential loss of ecosystem function.	Low to Medium	Certain	Long Term Residual
Sources of atmospheric emission associated with the mining operation are likely to include fugitive dust from materials handling operations, wind erosion of stockpiles and vehicle entrainment of road dust.	Low	Certain	Life of Operation Decommissioning
Increase in continuous noise levels; the disruption of current ambient	Low to medium	Certain	Long Term Life of Operation

noise levels; and the disruption of sensitive receptors by means of increased noise and vibration.			
Visual impact of the mine infrastructure, slimes dams and visibility of dust.	Medium to Low	Certain	Life of Operation Decommissioning
Potential negative impacts on traffic safety and deterioration of the existing road networks.	Low	Possible	Life of Operation Decommissioning
The deterioration of sites of cultural and heritage importance.	Low	Possible	Life of Operation
Loss of agricultural/grazing potential; influx of workers to the area increases health risks and loitering (resulting in lack of security and safety); negative impact of employment loss during site closure.	Low to Medium	Certain	Short-term and Closure
Loss of trust and a good standing relationship with the IAPs.	Low to medium	Possible	Life of Operation Decommissioning
Positive socio-economic impacts during operation, upliftment of previously disadvantaged communities.	Medium to high	Certain	Life of Operation Decommissioning to residual

vi) Methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks

(Describe how the significance, probability, and duration of the aforesaid identified impacts that were identified through the consultation process was determined in order to decide the extent to which the initial site layout needs revision)

The limits were defined in relation to the Mining Characteristics. Those for probability, significance and duration are subjective, based on rule of thumb and experience. The significance of the impacts is defined as follows:

The assessment of the impacts has been conducted according to a synthesis of criteria required by the integrated environmental management procedure.

Nature of impact

This is an appraisal of the type of effect the activity would have on the affected environmental component. Its description should include what is being affected, and how.

Extent

The physical and spatial size of the impact. This is classified as follows:

- **Local**
  The impacted area extends only as far as the activity, e.g. a footprint.
- **Site**
  The impact could affect the whole, or a measurable portion of the property.
- **Regional**

The impact could affect the area including the neighbouring farms, transport routes and the adjoining towns.

Duration

The lifetime of the impact which is measured in the context of the lifetime of the proposed phase (i.e. construction or operation).

- **Short term**
  The impact will either disappear with mitigation or will be mitigated through natural process in a short time period.
- **Medium term**
  The impact will last up to the end of the mining period, where after it will be entirely negated.
- **Long term (Residual)**
  The impact will continue or last for the entire operational life of the mine, but will be mitigated by direct human action or by natural processes thereafter.
- **Permanent**
  The only class of impact, which will be non-transitory. Mitigation either by man or natural process will not occur in such a way or in such a time span that the impact can be considered transient.

Intensity

This describes how destructive, or benign, the impact is. Does it destroy the impacted environment, alter its functioning, or slightly alter it. These are rated as:

- **Low**
  This alters the affected environment in such a way that the natural processes or functions are not affected.
- **Medium**
  The affected environment is altered, but function and process continue, albeit in a modified way.
- **High**
  Function or process of the affected environment is disturbed to the extent where it temporarily or permanently ceases.

  This will be a relative evaluation within the context of all the activities and the other impacts within the framework of the project.

Probability

This describes the likelihood of the impacts actually occurring. The impact may occur for any length of time during the life cycle of the activity, and not at any given time. The classes are rated as follows:

- **Improbable**
  The possibility of the impact occurring is very low, due either to the circumstances, design or experience.
- **Probable**
  There is a possibility that the impact will occur to the extent that provisions must be made therefore.
- **Highly probable**
  It is most likely that the impacts will occur at some or other stage of the development.
- **Definite**

The impact will take place regardless of any preventative plans, and mitigation measures or contingency plans will have to be implemented to contain the impact.

Determination of significance
Significance is determined through a synthesis of impact characteristics. Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. The classes are rated as follows:

- **No significance**
  The impact is not likely to be substantial and does not require any mitigatory action.
- **Low**
  The impact is of little importance, but may require limited mitigation.
- **Medium**
  The impact is of importance and therefore considered to have a negative impact. Mitigation is required to reduce the negative impacts to acceptable levels.
- **High**
  The impact is of great importance. Failure to mitigate, with the objective to reduce the impact to acceptable levels, could render the entire development option or entire project proposal unacceptable. Mitigation is therefore essential.

vii) The positive and negative impacts that the proposed activity (in terms of the initial site layout) and alternatives will have on the environment and the community that may be affected

(Provide a discussion in terms of advantages and disadvantages of the initial site layout compared to alternative layout options to accommodate concerns raised by affected parties)

During construction and operation of the mine, there is a possibility of sterilisation of the mineral reserves and resources due to improper placement of infrastructure. The infrastructure and slimes dam will alter the topography by adding features to the landscape. Topsoil removal and alluvial mining will unearth the natural topography. The construction of infrastructure and various facilities in the mining area can also result in loss of soil due to erosion. Vegetation where present will be stripped in preparation for placement of infrastructure and loading, and therefore the areas will be bare and susceptible to erosion. The topsoil that is stripped and piled on surrounding areas can be eroded by wind and rain. The soil will be carried away during runoff. The declared areas will be rehabilitated, but full restoration of soil might only occur over a number of years, subsequent to the re-establishment of vegetation. Furthermore, improper stockpiling and soil compaction can result in soil sterilisation. Leaching can also occur, resulting in the loss of nutrients.

During the construction and operation of the mine, there is a possibility that equipment might leak oil, thus causing surface spillages. The hydrocarbon soil contamination will render the soil unusuable unless they are decontaminated. The storage of fuels on site might have an impact on soil if the tanks that are available on site are not properly monitored and maintained to avoid leakages. Then there is the potential that contaminated soil can be carried through runoff to contaminate water resources and

soil stockpiled for rehabilitation. Soil pollution is therefore possible, but through mitigation it can be minimised.
The loss of land capability and land use can occur in two ways. Firstly, through topsoil removal, disturbances and loss of soil fertility; and secondly through the improper placement of infrastructure. The site has a land capability for limited grazing, but grazing activities can still be performed in areas not earmarked for mining, and with proper rehabilitation the land capabilities and land use potential can be restored.

If oil and fuel spillages occur, then it will seep into the underlying aquifers and contaminate ground water. Improper handling of hazardous material will cause contamination of nearby surface water resources during runoff episodes. Lack of storm control structures will lead to erosion of stockpiles during heavy rains and runoff will carry suspended solids into the downstream environment. This might cause high silt load and affect stream flow.

Construction and mining activities on site will reduce the natural habitat for ecological systems to continue their operation. It is not expected that the areas of high ecological function will rehabilitate following disturbance events. Vehicle traffic generates lots of dust which can reduce the growth success and seed dispersal of many small plant species. It is expected that protected species if present will be destroyed during the mining operation, the necessary permits will be obtained after the specialist studies have been completed to confirm the presence of the protected species.

While general clearing of the area and mining activities destroy natural vegetation, invasive plants can increase due to their opportunistic nature in disturbed areas. If invasive plants establish in disturbed areas, it may cause an impact beyond the boundaries of the mining site. These alien invasive species are thus a threat to surrounding natural vegetation and can result in the decrease of biodiversity and ecological value of the area. Therefore, if alien invasive species are not controlled and managed, their propagation into new areas could have a high impact on the surrounding natural vegetation in the long term. With proper mitigation, the impacts can be substantially reduced.

The transformation of natural habitats to mining and associated infrastructure will result in the loss of habitat affected individual species, and ecological processes. In turn this will result in the displacement of faunal species dependent upon such habitat. Increased noise and vibration due to mining activities will disturb and possibly displace birds and other wildlife. Fast moving vehicles take a heavy toll in the form of road kills of small mammals, birds, reptiles, amphibians and a large number of invertebrates. The construction of the mine and associated infrastructure will result in the loss of connectivity and fragmentation of natural habitat. Fragmentation of habitat will lead to the loss of migration corridors, in turn resulting in degeneration of the affected population's genetic make-up. This results in a subsequent loss of genetic variability between meta-populations occurring within the site. Pockets of fragmental natural habitats hinder the growth and development of populations.

During the mining operation the abovementioned activities have potential for dust generation. It is anticipated that the extent of dust emissions would vary substantially from day to day depending on the level of activity and the specific operations. The mine will add a certain amount of noise to the existing noise in the area. However, levels of noise generated by mining activities are low.

The impact of site generated trips on the traffic of the existing roads is experienced to be low. Nevertheless, if road safety is not administered it can have a high impact on the safety of fellow road users.

The mining operation, especially during construction, will create a number of new employment opportunities. The magnitude of this impact will depend on the number of people that will be employed and the number of contractors sourced. An influx of people into the area will possibly impact on safety and security of local residents. During the decommissioning and at closure of the mine, staff will most likely be retrenched. This can potentially flood the job market, resulting in people being unable to find new employment for a long period of time. It is normally more difficult for people with highly specialised skills to find employment immediately. Those with fewer skills have more flexibility in the job market.

Economic slump of the local towns after mine closure is an associated potential impact, although small due to the small scale of the operation. Income streams from wage bills as well as goods and services contracts (at all geographical levels) will come to an end, reducing the monetary income of individuals and mine-related businesses. People who have derived income directly or indirectly from the project may be inclined to leave the region in search of employment or business opportunities. This could result in further decline of the economy of the region as well as the abandonment of infrastructure. The loss of the mine workforce income will also impact upon non-mine related industries within the local and regional areas, particularly the rental property market and retail and service industries who would have received income during the life of mine from the salaried workforce.

It is likely, however that there will be residual positive economic impacts that are not fully reversed with the closure of the mine, and that the economy will not decline to its original level prior to the development of this project. This is because the mine will generate substantial income for the regional and local economy, both directly and indirectly, during its life.

It is difficult to predict the actual impact of the mine closure in advance, but it is acceptable to assume that the mine closure will have a negative impact on the local and regional economy with a high probability of occurrence, a Low severity and a Low significance.

Positive impacts include employment and training opportunities for people in the local community and local contractors; social upliftment and community development programmes; economic benefits.

viii) The possible mitigation measures that could be applied and the level of risk

(With regard to the issues and concerns raised by affected parties provide a list of the issues raised and an assessment/discussion of the mitigations or site layout alternatives available to accommodate or address their concerns, together with an assessment of the impacts or risks associated with the mitigation or alternatives considered)

Geology and Mineral Resource

Level of risk: Low

Mitigation measures

- Ensure that optimal use is made of the available mineral resource through proper planning.
- The alluvial deposit should be delineated first and all infrastructure positions should be selected with the main aim of avoiding sterilization of future resources.
- No dumping of materials prior to approval by the mine manager.

Topography

Level of risk: Low to Medium

Mitigation measures

- Mine all alluvial diamond gravels and rehabilitate material back up to natural ground level.
- Do controlled dumping.
- Employ effective rehabilitation strategies to restore surface topography of the area and plant site.
- Stabilise the excavations and mine residue deposits.
- All temporary infrastructures will be demolished during closure.

Soil Erosion

Level of risk: Low to Medium

Mitigation measures

- At no point may plant cover be removed within the no-development zones.
- All attempts must be made to avoid exposure of dispersive soils.
- Re-establishment of plant cover on disturbed areas must take place as soon as possible, once activities in the area have ceased.
- Ground exposure should be minimised in terms of the surface area and duration, wherever possible.
- The mining operation must co-ordinate different activities in order to optimise the utilisation of the alluvial mining operations and thereby prevent repeated and unnecessary dumping.
- The run-off from the exposed ground should be controlled with the careful placement of flow retarding barriers.

- The soil that is excavated during construction should be stock-piled in layers and protected by berms to prevent erosion.
- All stockpiles must be kept as small as possible, with gentle slopes (18 degrees) in order to avoid excessive erosional induced losses.
- Excavated and stockpiled soil material are to be stored and bermed on the higher laying areas of the footprint area and not in any storm water run-off channels or any other areas where it is likely to cause erosion, or where water would naturally accumulate.
- Stockpiles susceptible to wind erosion are to be covered during windy periods.
- Audits must be carried out at regular intervals to identify areas where erosion is occurring.
- Appropriate remedial action, including the rehabilitation of the eroded areas, must occur.
- Rehabilitation of the erosion channels and gullies.
- Dust suppression must take place, without compromising the water balance of the area.
- Linear infrastructure such as roads and pipelines will be inspected at least monthly to check that the associated water management infrastructure is effective in controlling erosion.

Soil Pollution

Level of risk: Low

Mitigation measures

- Refuelling must take place in well demarcated areas and over suitable drip trays to prevent soil pollution.
- Spill kits to clean up accidental spills from earthmoving machinery must be well-marked and available on site.
- Workers must undergo induction to ensure that they are prepared for rapid clean-up procedures.
- All facilities where dangerous materials are stored must be contained in a bund wall.
- Vehicles and machinery should be regularly serviced and maintained.

Land Capability and Land Use

Level of risk: Medium to High

Mitigation measures

- Ensure that optimal use is made of the available land through consultation with land owner and proper planning of mining activities.
- Surface agreement to be signed with land owners.
- Employ effective rehabilitation strategies to restore land capability and land use potential of the farm.
- All activities to be restricted within the demarcated areas.
- Ensure that land which is not used during construction is made available for grazing.

Groundwater

Level of risk: Low

Mitigation measures

- Refuelling must take place in well demarcated areas and over suitable drip trays to prevent soil pollution.
- Spill kits to clean up accidental spills from earthmoving machinery must be well-marked and available on site.
- Workers must undergo induction to ensure that they are prepared for rapid clean-up procedures.
- All facilities where dangerous materials are stored must be contained in a bund wall.
- Vehicles and machinery should be regularly serviced and maintained.

Surface Water

Level of risk: Low to Medium

Mitigation measures

- Sufficient care must be taken when handling hazardous materials to prevent pollution.
- Under no circumstances may ablutions occur outside the provided facilities.
- If servicing and washing of the vehicls occur on site, there must be specific areas constructed for these activities, which must have concrete foundations, bunding as well as oil traps to contain any spillages.
- A walled concrete platform, dedicated store with adequate flooring or bermed area and ventilation must be used to accommodate chemicals such as fuels, oils, paints, herbicide and insecticides.
- Oil residue shall be treated with oil absorbent and this material removed to an approved waste site.
- Spill kits must be easily accessible and workers must undergo induction regarding the use thereof.
- At all times care should be taken not to contaminate surface water resources.
- Store all litter carefully to prevent it from washing away or blown into any of the drainage channels or Kamfersdam within the area.
- Provide bins for staff at appropriate locations, particularly where food is consumed.
- The mining site should be cleared daily and litter removed.
- Conduct ongoing staff awareness programmes in order to reinforce the need to avoid littering, which contributes to surface water pollution.

Indigenous Flora

Level of risk: Low to Medium

Mitigation measures

- Minimise the footprint of transformation.
- Encourage proper rehabilitaiton of mined areas.
- Encourage the growth of natural plant species.
- Ensure measures for the adherence to the speed limit.

- Footprint areas of the mining activities must be scanned for Red Listed and protected plant species prior to mining.
- It is recommended that these plants are identified and marked prior to mining.
- These plants should, where possible, be incorporated into the design layout and left in situ.
- However, if threatened of destruction by mining, these plants should be removed (with the relevant permits from DAFF and DENC) and relocated if possible.
- A management plan should be implemented to ensure proper establishment of ex situ individuals, and should include a monitoring programme for at least two years after re-establishment in order to ensure successful translocation.
- All those working on site must be educated about the conservation importance of the fauna and flora occurring on site.

All Invasive Plants

Level of risk: Low to Medium

Mitigation measures

- Minimise the footprint of transformation.
- Encourage proper rehabilitation of mined areas.
- Encourage the growth of natural plant species.
- Mechanical methods (hand-pulling) of control to be implemented extensively.
- Annual follow-up operations to be implemented.

Fauna

Level of risk: Low to Medium

Mitigation measures

- Careful consideration is required when planning the placement for stockpiling topsoil and the creation of access routes in order to avoid the destruction of habitats and minimise the overall mining footprint.
- The appointment of a full-time ECO must render guidance to the staff and contractors with respect to suitable areas for all related disturbance.
- The extent of the mine should be demarcated on site layout plans, and no construction personnel or vehicles may leave the demarcated area except those authorised to do so. Those areas surrounding the mine site that are not part of the demarcated development area should be considered as a no go zone for employees, machinery or even visitors.
- All those working on site must be educated about the conservation importance of the fauna and flora occurring on site.
- The ECO must ensure that all contractors and workers undergo Environmental induction prior to commencing with work on site.
- The environmental induction should occur in the appropriate languages for the workers who may require translation.
- Reptiles and amphibians that are exposed during the clearing operations should be captured for later release or translocation by a qualified expert.
- Employ measures that ensure adherence to the speed limit.

Habitat

Level of risk: Low to Medium

Mitigation measures

- Mining activities must be planned, where possible in order to encourage faunal dispersal and should minimise dissection or fragmentaton of any important faunal habitat type.
- The extent of the mining area should be demarcated on site layout plans (preferably on disturbed areas or those identified with low conservation importance). No construction personnel or vehicles may leave the demarcated area except those authorised to do so.

Air Quality

Level of risk: Low

Mitigation measures

- Vegetation must be removed when soil stripping is required only. These areas should be limited to include those areas required for mining only, hereby reducing the surface area exposed to wind erosion. Adequate demarcation of these areas should be undertaken.
- Control options pertaining to topsoil removal, loading and dumping are generally limited to wet suppression.
- Where it is logistically possible, control methods for gravel roads should be utilised to reduce the re-suspension of particulates. Feasible methods include wet suppression, avoidance of unnecessary traffic, speed control and avoidance of track-on of material onto paved and treated roads.
- The length of time where alluvial dimoand mining areas are exposed should be restricted. Mining should not be delayed after vegetation has been cleared and topsoil removed where possible.
- Dust suppression methods should, where logistically possible, must be implemented at all areas that may/are exposed for long periods of time.
- For all mining activities management should undertake to implement health measures in terms of personal dust exposure, for all its employees.

Noise and Vibration

Level of risk: Low to Medium

Mitigation measures

- Restrict mining activities to daytime unless agreements obtained to do 24hr operations.
- Systematic maintenance of all forms of equipment, training of personnel to adhere to operational procedures that reduce the occurrence and magnitude of individual noisy events.
- Where possible material stockpiles should be placed so as to protect the boundaries from noise to individual operations.
- Standardised noise measurements should be carried out on individual equipment at the delivery to site to construct a reference data-base and regular checks carried out to ensure that equipment is not deteriorating and to detect

increases which could lead to increase in the noise impact over time and increased complaints.

- Environmental noise monitoring should be carried out regularly to detect deviations from predicted noise levels and enable corrective measures to be taken where warranted.

Visual Impacts

Level of risk: Low

Mitigation measures

- Infrastructure should be placed to optimise the natural screening capacity of the vegetation.
- Where practical, protect existing vegetation clumps during in order to facilitate screening during the mining operation.
- Remove rubble and other building rubbish off site as soon as possible or place it in a container in order to keep the mining site free from additional unsightly elements.
- Dust suppression procedures should be implemented especially on windy days during earth works.
- Rehabilitation should aim to establish a diverse and self-sustaining surface cover that is visually and ecologically representative of naturally occurring vegetation species.
- Implement a management plan for the post-mining site in order to control the invasion of alien vegetation and to manage erosion, until the site is fully rehabilitated.

Traffic and Road Safety

Level of risk: Low

Mitigation measures

- Implement measures that ensure the adherence to traffic rules.

Heritage Resources

Level of risk: Low

Mitigation measures

- The heritage if any is encountered and cultural resources (e.g. graveyards, ruins, historic structures, etc.) must be protected and preserved by the delination of no go zones.
- Intact bedrock strata should be avoided during mining of terrace gravels where possible.
- Stone tools should be avoided where possible and fresh exposure should be recorded before destruction. All stone tool artefacts should be recorded, mapped and collected before destruction.
- Should development necessitate impact on any building structures, the developer should apply for a SAHRA Site Destruction Permit prior to commencement of construction.

Socio-Economic

Level of risk: Low to medium

Mitigation measures

- The mine must ensure that false expectations are not created regarding job creation.
- Jobs must be allocated as advertised and in so far as is possible to local inhabitants.
- Contractors and employees should not be permitted to wander outside the mining area.
- Uncontrolled settlement of contractors and workers outside of the site will be prevented.
- The expectations of what benefits can accrue to the community must be managed from the initiation of the project.
- Commitments as set out in the SLP must be attained.

Interested and Affected Parties

Level of risk: Low

Mitigation measures

- Maintain active communications with IAPs.
- Ensure transparent communication with IAPs at all times.
- IAPs must be kept up to date on any changes in the mining operation.
- A complaints management system should be maintained by the mine to ensure that all issues raised by community members are followed up and addressed appropriately.

ix) The outcome of the site selection Matrix. Final Site Layout Plan

(Provide a final site layout plan as informed by the process of consultation with interested and affected parties)

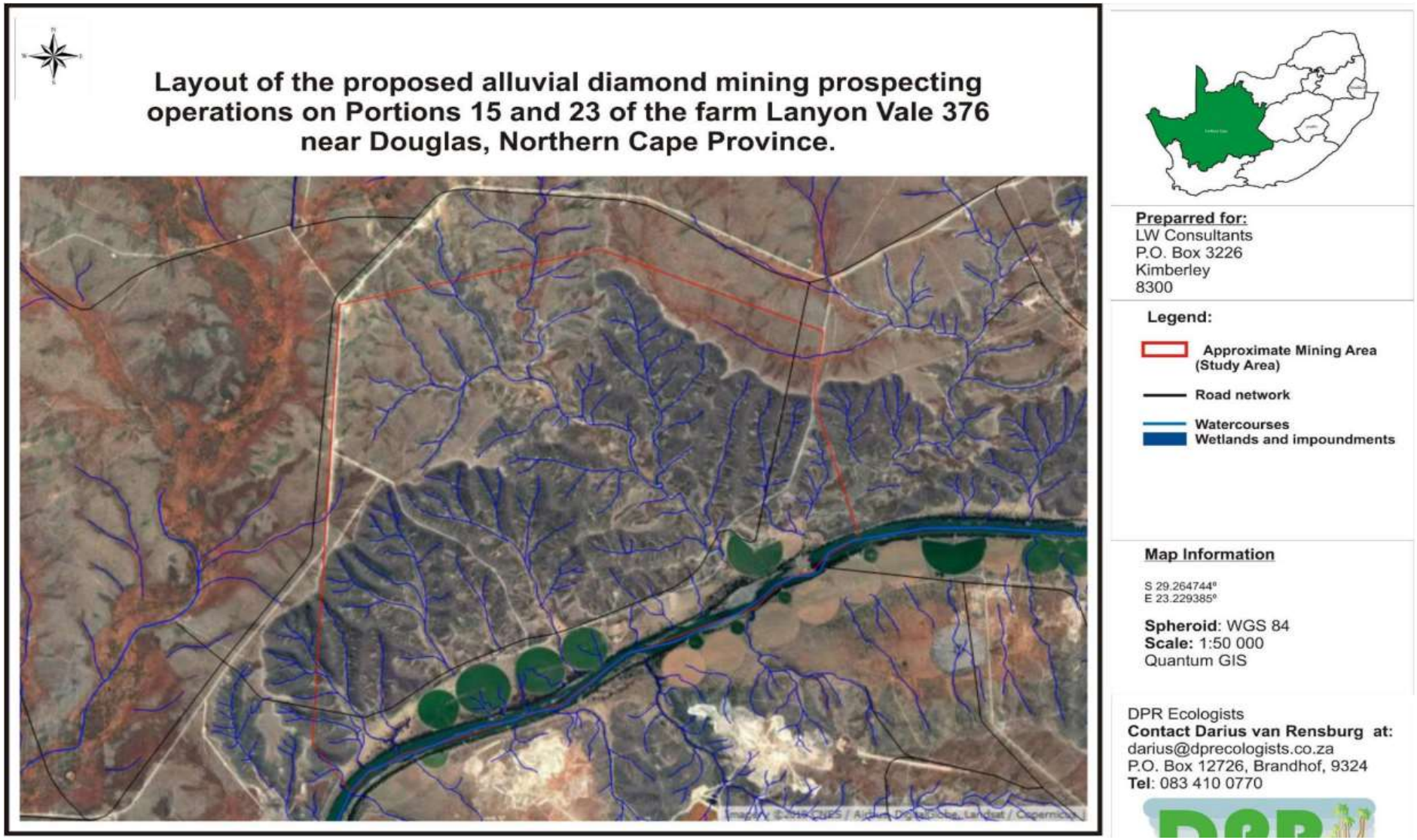


Figure 31. Final site layout plan (taken out of the ecological study by DPR , June 2018)

x) Motivation where no alternative sites were considered

No alternative location for the proposed mining operation was considered, as the alluvial diamond resources has been deposited in this area. There is therefore no other alternative with regard to the overall operation footprint.

xi) Statement motivating the preferred site.

(Provide a statement motivating the final site layout that is proposed)

Not applicable. There is no alternative development location for the site as this is the area with the mineable resource was proven.

i) Plan of study for the Environmental Impact Assessment Process

i) Description of alternatives to be considered including the option of not going ahead with the activity

- **Land use development alternatives:**
  The site layout may vary, depending on the operational requirements. However the final design and layout of the infrastructure will be planned and decided upon by the developer on the grounds of reserves, and placement of infrastructure based on hauling distance, environmental features such as wind direction, heritage findings, protected species, and stormwater management on the mine.

- **No-go option:**
  The following positive impacts will be lost if the proposed mining project is not developed:
  - TAX and VAT obligations to SARS as well as Royalties;
  - CAPEX spent locally and regionally;
  - Employment opportunities;
  - Payroll income;
  - Operating expenditure and maintenance (OPEX);
  - Revenue.

Mining activities are believed to be one of the economically beneficial options for the areas.

If the operation does not continue it would hold back any potential employment for the region and the families who are likely to benefit from the positive employment opportunities. Simultaneously, it may have a stagnant effect on the economy of South Africa and the diamond industry as a whole. Substantial tax benefits to the State and Local Government will also be inhibited.

Mining forms an integrated part of the social and economical growth of South Africa.

ii) Description of the aspects to be assessed as part of the environmental impact assessment process

(The EAP must undertake to assess the aspects affected by each individual mining activity whether listed or not, including activities such as blasting, Loading, hauling and transport, and mining activities such as Excavations, stockpiles, dicard dumps or dams, water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control berms, roads, pipelines, powerlines, conveyers, etc..etc…)

1. The clearing of vegetation for:
   - Access roads and haul roads
   - Surface infrastructure
   - Product Stockpile area
   - Waste disposal site (domestic and industrial waste)

2. The stripping and stockpiling of topsoil.

3. Load and Haul Operation for the mining of alluvial gravels.

4. Altering the characteristics of surface water features (possible drainage channel).

5. The development of temporary stockpiles:
   - Topsoil storage area;
   - Mine Residue Stockpile for slime.

6. The rehabilitation of footprint areas where the open blocks have been excavated.

7. The construction of Processing plant.

8. Loading, hauling and transporting of ROM, product and material

9. Water holding facilities, pipeline and stormwater control:
   - Clean & Dirty water system: Stormwaterdam / Water storage facility;
   - Water distribution Pipeline;
   - Water tank.

10. Fuel storage and refuelling bays;
    - Fuel Storage facility (Diesel tanks);
    - Concrete bund walls and diesel depots.

11. Supporting infrastructure:
    - Temporary Offices;
    - Office Parking Bay;
    - Temporary Workshop and Wash bay;
    - Salvage yard (Storage and laydown area);
    - Ablution facilities/ Sewage facilities;
    - Generators;
    - Pipelines transporting water;

(ii) Description of aspects to be assessed by specialists:

The application area is next to the Orange River. The neccesarry studies (Ecological which will include wetland delineation and heritage and palaentological studies will be done. A desktop Ecological and wetland delineation was done by Darius van Rensburg of DPR attached as Appendix 4.

(iii) Proposed method of assessing the environmental aspects including the proposed method of assessing alternatives:

The receiving environment will be determined using a combination of on-site observations, spatial information, project description, site layout and previous studies currently available to the EAP. Based on the EAPs knowledge and experience, the receiving environment will include geological features, topography, land use, archaeological and historical sites, surface water, groundwater, terrestrial ecology, air quality, noise, etc.

The identification of potential impacts of the mining activity will be based on the legal requirements; the nature of the proposed activity; the nature of the receiving environment; and issues raised during the public participation process. Considering the factors listed above and based on the EAPs knowledge and experience, environmental impacts that could potentially result from the mining activities include impacts on air quality, noise, fauna, flora, ground water, terrestrial ecology, heritage resources, socio-economy, aquatic environments, visuals, storm water and erosion.

The consideration of alternatives is a critical component of the EIA process, where an appropriate range of alternatives require consideration whilst achieving the desired objective of the proposed project. In order to ensure that the proposed project enables sustainable mining, a number of feasible options will be explored. The various alternatives in terms of land use, project infrastructure, mining method and proceeding without the mining operation will be assessed in terms of logistical practicality, environmental acceptability and economic feasibility. Alternatives for the locality of the mining operation will however not form part of this consideration, as the location of the mining site is determined by the geological location of the mineral resource.

(iv) The proposed method of assessing duration significance:

The lifetime of the impact will be measured in the context of the lifetime of the proposed phase or activity.

Weight	Duration of Impact	Explanation of Duration
1	Very Short	Less than 1 year
2	Short	1 to 5 years
3	Medium	6 to 15 years
4	Long term (Life of project)	16 to 50 years
5	Very Long term	Longer than 50 years
6	Permanent	Permanent

- **Short term**
  The impact will either disappear with mitigation or will be mitigated through natural process in a short time period.

- **Medium term**
  The impact will last up to the end of the mining period, where after it will be entirely negated.

- **Long term**
  The impact will continue or last for the entire operational life of the mine, but will be mitigated by direct human action or by natural processes thereafter.

- **Permanent**
  The only class of impact, which will be non-transitory. Mitigation either by man or natural process will not occur in such a way or in such a time span that the impact can be considered transient.

(v) The stages at which the Competent Authority will be consulted:

Consultation with the Competent Authority will take place throughout the application process, however more specifically; consultation will take place before submission of the Scoping Report and again before submission of the EIA/EMPR Report.

(vi) Particulars of the public participation process with regard to the Impact Assessment process that will conducted:

1. Steps to be taken to notify interested and affected parties:

(These steps must include the steps that will be taken to ensure consultation with the affected parties identified in (h)(ii) herein.)

The consultation process as described by NEMA for Environmental Authorisation was followed and is still in process. The following steps were already taken:

A copy of the draft Scoping Report (burned to disc) was sent to all identified interested and affected parties. All Government Departments identified were also notified by registered letters. The surface owners also received registered letters.

A notice will also placed on the gates at the entrance of the proposed site to invite any other interested parties to come forward and to register. Other notices will be brought up at relevant public places to inform the communities in the surrounding area of the proposed mining operation.

The draft Scoping Report was also placed at the Douglas public Library along with a notice to notify the public of the proposed mining operation as well as to provide access to the draft Scoping Report to the community.

Furthermore, an advert will be placed in the DFA Newspaper in the third week of April 2022 which invited any other interested or affected party to come forward and register.

Proof of consultation (attendance registers, minutes of meetings and response forms) is attached as **Appendix 3**. The consultation process is still in process.

2. Details of the engagement process to be followed:

(Describe the process to be undertaken to consult interested and affected parties including public meetings and one on one consultation. NB the affected parties must be specifically consulted regardless of whether or not they attended public meetings and record of such consultation will be required in the EIA at a later stage.)

The following procedures will be followed:

- An IAP register will be compiled and regular and ongoing follow-up sessions will be held with the IAPs to monitor those issues raised during the IAP process and that are deemed to be affected by the mining operation.
- Environmental documents will be sent to all registered IAPs and this documentation (Scoping, EMP and EMPR) will be made available in public libraries.
- Records will be kept of the complaints and the mitigation measures implemented.

3. Description of the information to be provided to Interested and Affected Parties:

(Information to be provided must include the initial site plan and sufficient detail of the intended operation and the typical impacts of each activity, to enable them to assess what impact the activities will have on them or on the use of their land.)

The following information will be provided to IAPs:

- The site plan;
- List of activities to be authorised;
- Scale and extent of activities to be authorised;
- Typical impacts of activities to be authorised;
- The duration of the activity.

The following information will be requested from the IAPs:

- To provide information on how they consider that the proposed activities will impact on them or their socio-economic conditions;
- To provide written responses stating their suggestions to mitigate the anticipated impacts of each activity;
- To provide information on current land uses and their location within the area under consideration;
- To provide information on the location of environmental features on site to make proposals as to how and to what standard the impacts on site can be remedied. They will be requested to make written proposals;
- To mitigate the potential impacts on their socio economic conditions to make proposals as to how the potential impacts on their infrastructure can be managed, avoided or remedied).

(vii) Description of the tasks that will be undertaken during the environmental impact assessment process:

Determining environmental attributes

The receiving environment will be determined using a combination of on-site observations, spatial information, project description, site layout and previous studies currently available to the EAP. Based on the EAPs knowledge and experience, the receiving environment will include geological features, topography, land use, archaeological and historical sites, surface water, groundwater, terrestrial ecology, air quality, noise, etc.

Identification of impacts and risks

The identification of potential impacts of the mining activity will be based on the legal requirements; the nature of the proposed activity; the nature of the receiving environment; and issues raised during the public participation process.

Considering the factors listed above and based on the EAPs knowledge and experience, environmental impacts that could potentially result from the mining activities include impacts on air quality, noise, fauna, flora, ground water, surface water, terrestrial ecology, heritage resources, socio-economy, aquatic environments, visuals, stormwater and erosion.

Consideration of alternatives

The consideration of alternatives is a critical component of the EIA process, where an appropriate range of alternatives require consideration whilst achieving the desired objective of the mining project. In order to ensure that the proposed project enables sustainable mining, a number of feasible options will be explored. The various alternatives in terms of land use, project infrastructure, mining method and proceeding without the mining operation will be assessed in terms of logistical practicality, environmental acceptability and economic feasibility.

Alternatives for the locality of the mining operation will however not form part of this consideration, as the location of the mining site is determined by the geological location of the mineral resource.

Process to assess and rank impacts

Before any assessment can made the following evaluation criteria need to be described

Table 12. Explanation of PROBABILITY of impact occurrence

Weight	Probability of Impact Occurrence	Explanation of Probability
1	Very Low	<20% sure of particular fact or likelihood of impact occurring
2	Low	20 – 39% sure of particular fact or likelihood of impact occurring
3	Moderate	40 – 59% sure of particular fact or likelihood of impact occurring
4	High	60 – 79% sure of particular fact or likelihood of impact occurring
5	Very High	80 – 99% sure of particular fact or likelihood of impact occurring
6	Definite	100% sure of particular fact or likelihood of impact occurring

Table 13. Explanation of EXTENT of impact

Weight	Extent of Impact	Explanation of Extent
1	Site Specific	Direct and Indirect impacts limited to site of impact only
2	Surrounding Area	Direct and Indirect impacts affecting environmental elements within 2 km of site

3	Local Municipality	Direct and Indirect impacts affecting environmental elements within the Syancuma/ Douglas area
4	Regional/District	Direct and Indirect impacts affecting environmental elements within District (Douglas District)
5	Provincial	Direct and Indirect impacts affecting environmental elements in the Northern Cape Province

Table 14. Explanation of DURATION of impact

Weight	Duration of Impact	Explanation of Duration
1	Very Short	Less than 1 year
2	Short	1 to 5 years
3	Medium	6 to 15 years
4	Long term (Life of project)	16 to 50 years
5	Very Long term	Longer than 50 years
6	Permanent	Permanent

Table 15. Explanation of SEVERITY of the impact

Weight	Impact Severity	Explanation of Severity
1	No Impact	There will be no impact at all – not even a very low impact on the system or any of its parts.
2	Very Low	Impact would be negligible. In the cast of negative impacts, almost no mitigation and/or remedial activity would be needed, and any minor steps which might be needed would be easy, cheap and simple. In the case of positive impacts alternative means would almost all likely to be better, if one or a number of ways, then this means of achieving the benefit.
3	Low	Impact would be of a low order and with little real effect. In the case of negative impacts, mitigation and/or remedial activity would be either easily achieved or little would be required or both. In the case of positive impacts alternative means for achieving this benefit would be easier, cheaper, more effective, less time-consuming, or some combination of these.
4	Moderately Severe	Impact would be real but not substantial within the bounds of those which could occur. In the case of negative impacts, mitigation and/or remedial activity would be both feasible and fairly easily possible. In the case of positive impacts other means other means of covering these benefits would be about equal in cost and effort.
5	High Severance	Impacts of substantial order. In the case of negative impacts, mitigation and/or remedial activity would be feasible but difficult, expensive, time consuming or some combination of these. In the case of positive impacts other means of achieving this benefit would be feasible, but these would be more difficult, expensive, time-consuming or some combination of these.

6	Very High Severity	Of the highest order possible within the bounds of impacts which could occur, in the case of negative impacts, there would be no possible mitigation and/or remedial activity to offset the impact at the spatial or time scale for which was predicted. In the case of positive impacts there is no real alternative to achieving the benefit.

Methodology used in determining and ranking the nature, severity, consequences, extent, duration and probability of potential environmental impacts and risks

The criteria used to assess the significance of the impacts are shown in the table below. The limits were defined in relation to mining characteristics. Those for probability, intensity/severity and significance are subjective, based on rule-of-thumb and experience. Natural and existing mitigation measures were considered. These natural mitigation measures were defined as natural conditions, conditions inherent in the project design and existing management measures, which alleviate impacts. The significance of the impacts was calculated by using the following formula:

(Severity + Extent + Duration) x Probability weighting

For the impact assessment, the different project activities and associated infrastructure were identified and considered in order to identify and analyse the various possible impacts.

Table 16.

SIGNIFICANCE				
Colour Code	**Significance rating**	**Rating**	**Negative Impact**	**Positive Impact**
	Very low	3 -16	Acceptable/Not serious	Marginally Positive
	Low	17 - 22	Acceptable/Not serious	Marginally Positive
	Medium-Low	23 -33	Acceptable/Not desirable	Moderately Positive
	Medium	34 - 48	Generally undesirable	Beneficial
	Medium-High	49 - 56	Generally unacceptable	Important
	High	57 - 70	Not Acceptable	Important
	Very High	90 - 102	Totally unacceptable	Critically Important

Significance of impacts is defined as follows:

Very Low - Impact would be negligible. Almost no mitigation and/or remedial activity would be needed, and any minor steps which might be needed would be easy, cheap and simple.

Low - Impact would have little real effect. Mitigation and/or remedial activity would be either easily achieved or little would be required or both.

Medium Low- Impact would be real but not substantial within the bounds of those which could occur. Mitigation and/or remedial activity would be both feasible and fairly easily possible.

Medium - Impact would be real but not substantial within the bounds of those which could occur. Mitigation and/or remedial activity would be feasible and possible.

Medium High- Impact would be real but could be substantial within the bounds of those which could occur. Mitigation and/or remedial activity would be both feasible and possible but may be difficult and or costly.

High - Impacts of substantial order. Mitigation and/or remedial activity would be feasible but difficult, expensive, time consuming or some combination of these.

Very High - Of the highest order possible within the bounds of impacts which could occur. There would be no possible mitigation and/or remedial activity to offset the impact at the spatial or time scale for which was predicted.

(viii) Measures to avoid, reverse, mitigate, or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored:

ACTIVITY Whether listed or not listed (e.g. excavations, blasting, stockpiles, discard dumps or dams, loading, hauling and transport, water suppy dams and boreholes, accommodation, offices, ablution, stores, workshops, processing lant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc…)	POTENTIAL IMPACT (e.g. dust, noise, drainage, surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc…etc…)	MITIGATION TYPE modify, remedy, control or stop (e.g. noise control measures, stormwater control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc…etc…) (e.g. modify through alternative method. Control through management and monitoring through rehabilitation.)	POTENTIAL FOR RESIDUAL RISK
Ablution facilities Chemical toilets	• Soil contamination • Groundwater contamination • Odours	• Maintenance of chemical toilets on regular basis. • Removal of containers upon closure.	Very low
Clean & Dirty water system	• Surface disturbance • Groundwater contamination • Soil contamination • Surface water contamination	• Maintenance of berms and trenches. • Oil traps used in relevant areas. • Drip trays used. • Immediately clean hydrocarbon spill.	Low/Medium
Diesel tanks	• Groundwater contamination • Removal and disturbance of vegetation cover and natural habitat of fauna • Soil contamination • Surface disturbance	• Maintenance of diesel tanks and bund walls. • Oil traps. • Groundwater quality monitoring. • Drip tray at re-fuelling point. • Immediately clean hydrocarbon spill.	Medium
Opencast Alluvial Diamond mining	• Dust • Possible Groundwater contamination • Noise • Removal and disturbance of vegetation cover and natural habitat of fauna • Soil contamination	• Access control • Dust control and monitoring • Groundwater quality monitoring • Noise control and monitoring • Continuous rehabilitation • Stormwater run-off control • Immediately clean hydrocarbon spill • Drip trays	Medium

	• Surface disturbance • Surface water contamination	• Erosion control	
Generators	• Groundwater contamination • Noise • Removal and disturbance of vegetation cover and natural habitat of fauna • Soil contamination • Surface disturbance	• Access control • Maintenance of generator and bund walls • Noise control and monitoring • Oil traps • Groundwater quality monitoring • Immediately clean hydrocarbon spill	Medium
Office – Pre-fabricated office blocks on concrete	• Removal and disturbance of vegetation cover and natural habitat of fauna • Soil contamination • Surface disturbance	• Immediately clean hydrocarbon spill • Rip disturbed areas to allow re-growth of vegetation cover	Low
Parking bay	• Dust • Groundwater contamination • Noise • Removal and disturbance of vegetation cover and natural habitat of fauna • Surface disturbance	• Dust control and monitoring • Noise control and monitoring • Drip trays • Stormwater run-off control. • Immediately clean hydrocarbon spills • Rip disturbed areas to allow re-growth of vegetation cover	Low
Processing plant	• Dust • Noise • Groundwater contamination • Removal and disturbance of vegetation cover and natural habitat of fauna • Soil contamination • Surface disturbance	• Access control • Maintenance of processing plant • Dust control and monitoring • Groundwater quality and level monitoring • Noise control and monitoring • Drip trays • Stormwater run-off control. • Immediately clean hydrocarbon spills • Rip disturbed areas to allow re-growth of vegetation cover	Medium
Water distribution Pipeline	• Surface disturbance • Possible Groundwater contamination	• Maintenance of pipes.	Low

	• Soil contamination • Surface water contamination		
Roads	• Dust • Possible Groundwater contamination • Noise • Removal and disturbance of vegetation cover and natural habitat of fauna • Surface disturbance	• Maintenance of roads • Dust control and monitoring • Noise control and monitoring • Speed limits • Stormwater run-off control. • Erosion control • Immediately clean hydrocarbon spills • Rip disturbed areas to allow re-growth of vegetation cover	Low to Medium
Salvage yard	• Possible Groundwater contamination • Removal and disturbance of vegetation cover and natural habitat of fauna • Soil contamination • Surface disturbance • Surface water contamination	• Access control • Maintenance of fence. • Stormwater run-off control • Immediately clean hydrocarbon spill	Low
Stockpile area	• Dust • Possible Groundwater contamination • Noise • Removal and disturbance of vegetation cover and natural habitat of fauna • Surface disturbance	• Dust control and monitoring • Noise control and monitoring • Drip trays • Stormwater run-off control. • Immediately clean hydrocarbon spills • Rip disturbed areas to allow re-growth of vegetation cover	Low
Topsoil storage area	• Dust • Removal and disturbance of vegetation cover and natural habitat of fauna • Soil disturbance • Surface disturbance	• Dust control and monitoring • Stormwater run-off control. • Continuous rehabilitation • Rip disturbed areas to allow re-growth of vegetation cover • Backfilling of topsoil during rehabilitation	Low
Waste disposal site	• Groundwater contamination	• Storage of waste within receptacles	Low

	• Surface water contamination	• Storage of hazardous waste on concrete floor with bund wall • Removal of waste on regular intervals.	
Mine Residue Deposit – Slimes	• Dust • Possible Groundwater contamination • Noise • Removal and disturbance of vegetation cover and natural habitat of fauna • Surface disturbance	• Dust control and monitoring • Groundwater quality monitoring • Noise control and monitoring • Stormwater run-off control. • Rip disturbed areas to allow re-growth of vegetation cover	Low to Medium
Washbay	• Possible Groundwater contamination Removal and disturbance of vegetation cover and natural habitat of fauna • Soil contamination	• Groundwater quality and level monitoring • Concrete floor with oil/water separator • Stormwater run-off control • Immediately clean hydrocarbon spills	Low
Water tank: It is anticipated that the operation will establish 1 x 10 000 litre water tanks with purifiers for potable water.	• Orange river water and usage • Surface disturbance	• Monitor water quality and quantity • Maintenance of tanks (check for leaks).	Low

(ix) Other information required by the Competent Authority:

1. Compliance with the provisions of Sections 24(4)(a) and (b) read with Section 24(3)(a) and (7) of the National Environmental Management Act (Act 107 of 1998), the EIA report must include the:-

a. Impact on the socio-economic conditions of any directly affected person:
(Provide the results of investigation, assessment and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any directly affected parson including the landowner, lawful occupier, or, where applicable, potential beneficiaries of any land restitution claim, attach the investigation report as Appendix '7' and confirm that the applicable mitigation is reflected in 2.5.3, 2.11.6 and 2.12 herein.)

The socio-economic conditions of the local community could be affected in two ways:

- Negative impacts to the welfare of the residents and workers through general nuisance, dust generation, damages to properties and any associated potential safety risks.
- Positive impacts through job creation and local business opportunities.
- The consultation with interested and affected parties is on-going and any issues, concerns or comments will be considered and included in the EIA report and control measures will be presented in the EMP report.

b. Impact on any national estate referred to in Section 3(2) of the National Heritage Resources Act:
(Provide the results of investigation, assessment and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any national estate referred to in Section 3(2) of the National Heritage Resources Act, 1999 (Act 25 of 1999) with the exception of the national estate contemplated in Section 3(2)(i)(vi) and (vii) of that Act, attach the investigation report as Appendix '8' and confirm that the applicable mitigation is reflected in 2.5.3, 2.11.6 and 2.12 herein.)

A Heritage and Palaeontological Impact study will be done to determine if any such sites and/or objects are located on the sites itself.

During Screening the Lanyon Vale site was indicated as Low for Archaeological and Culture Heritage theme and Medium and High sensitivity on Palaeontology.

(x) Other matters required in terms of Sections 24(4)(a) and (b) of the Act:
(The EAP managing the application must provide the Competent Authority with details, written proof of an investigation as required by Section 24(4)(b)(i) of the Act and motivation if no reasonable or feasible alternatives, as contemplated in sub-regulation 22(2)(h), exist. The EAP must attach such motivation as Appendix '9'.)

As mentioned before, the specific occurrence of diamonds in the area dictates the selection of the specific mining site and there are no alternatives in terms of project location.

Site selection of the mining areas was guided by:

- Comments received during the consultation process during mining,
- Geological investigation / Bulk sampling results,
- Current land use,
- Proximity to historical mining sites,
- Proximity to the Orange River,
- Proximity to receptors,
- Proximity to infrastructure and
- Natural undisturbed areas.
- Careful consideration has been given to current land use. Alternative sites located on active farming lands have been excluded.

The mining operation will provide ±46 jobs and will also add to the increased economic activity and the area surrounding the farm.

Negative impacts on the area are expected to be temporary and can be mitigated to a large extent if the recommendations of the EMPR area adhered to e.g. rehabilitation.

(xi) Undertaking regarding correctness of information:

I, RH Oosthuizen, ID number 7004180037082, herewith undertake that the information provided in the foregoing report is correct, and that the comments and inputs from stakeholders and Interested and Affected Parties has been correctly recorded in the report.

Signature of EAP
Date: 11 April 2022

(xii) Undertaking regarding level of agreement:

I, RH Oosthuizen, ID number 7004180037082, herewith undertake that the information provided in the foregoing report is correct, and that the level of agreement with Interested and Affected Parties and stakeholders has been correctly recorded and reported herein.

Signature of EAP
Date: 11 April 2022

- END -