



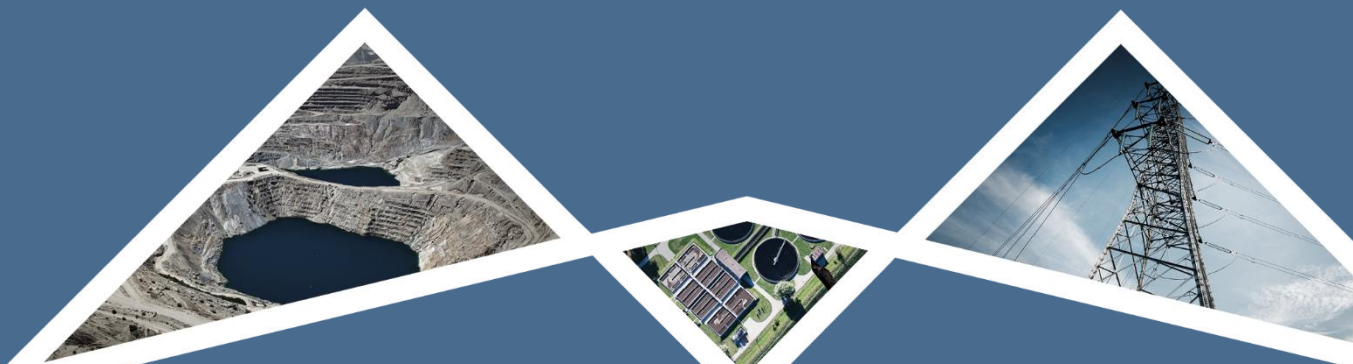
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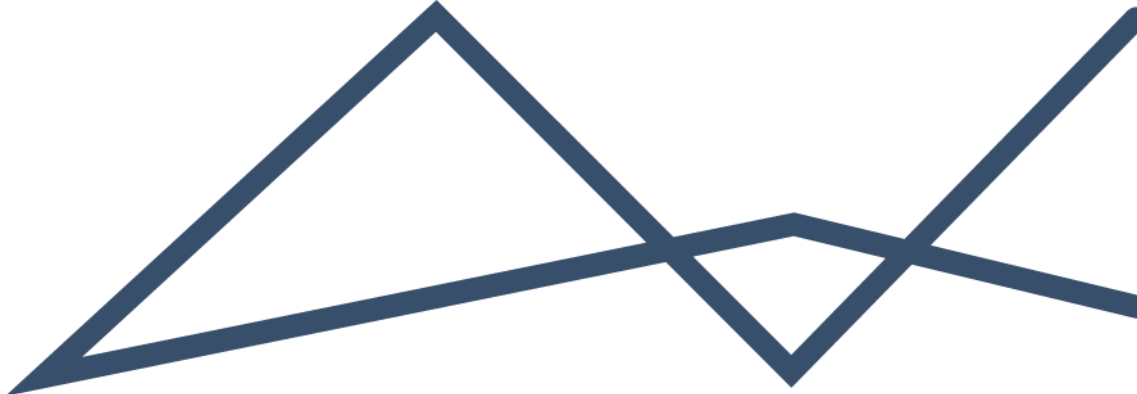
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# FINAL REHABILITATION, DECOMMISSIONING AND CLOSURE PLAN, INCORPORATING AN ANNUAL REHABILITATION PLAN AND ENVIRONMENTAL RISK ASSESSMENT

BLACK MOUNTAIN MINING – SANDGAT PROSPECTING RIGHT  
PROJECT

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Appendix 1: Cost Estimate



# 1 INTRODUCTION

Black Mountain Mining (Pty) Ltd (BMM) (the Applicant) has submitted an application for a Prospecting Right (PR) in terms of Section 16 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) (MPRDA) and an Application for Environmental Authorisation in terms of Chapter 4 of GNR 982 promulgated under the National Environmental Management Act (Act 107 of 1998) (NEMA) to prospect for ferrous and base metals (Copper Ore, Iron Ore, Lead Ore, Zinc Ore, Manganese Ore, Nickel and Molybdenum), precious metals (Gold Ore, Silver Ore), and all associated metals and minerals.

The proposed project will aim to ascertain if economically viable mineral deposits exist within the application area. In order to undertake prospecting activities, Black Mountain Mining will require a Prospecting Right in terms of the Mineral and Petroleum Resources Development Act (MPRDA, Act No.28 of 2002). The Applicant is also required to obtain an Environmental Authorisation (EA) in terms of the National Environmental Management Act (NEMA, Act No. 107 of 1998) which involves the submission of a Basic Assessment Report (BAR). Environmental Impact Management Services (Pty) Ltd (EIMS) have been appointed by Black Mountain Mining to compile the BAR in support of the Prospecting Right application submitted by EIMS on behalf of Black Mountain Mining, which in turn will be submitted to the Department of Mineral and Petroleum Resources (DMPR) for adjudication.

EIMS has been appointed as the independent consultants to assess the environmental impacts and requirements in terms of the Mineral and Petroleum Resources Development Act (Act No. 28 of 2002, MPRDA) and the National Environmental Management Act (Act No.107 of 1998, NEMA). This includes submitting an application for a prospecting right and environmental authorisation as well as preparation of a Basic Assessment Report and EMPr for the proposed prospecting activity to the DMR.

In accordance with Section 24P of the NEMA the Applicant must, before the Minister responsible for mineral resources issues the EA, comply with the prescribed financial provision for the rehabilitation, closure and ongoing post decommissioning management of negative environmental impacts. The Final Rehabilitation, Decommissioning and Closure Plan (FRDCP) aims to meet this requirement and has been prepared in accordance with the requirements of the NEMA Financial Provisioning Regulations (2015) (NEMA GNR 1147).

According to the regulations, financial provision must be made for rehabilitation and remediation; decommissioning and closure activities at the end of prospecting, exploration, mining or production operations; and remediation and management of latent or residual environmental impacts which may become known in the future. In order to address these requirements, this document includes an annual rehabilitation plan, a final rehabilitation, decommissioning and mine closure plan, and an environmental risk assessment report.

Table 1 below lists the specific requirements that must be contained in each of the three plans as per the NEMA GNR 1147 Appendices 3, 4 and 5, as well as the associated section in this report where each requirement is addressed.

Table 1: NEMA GNR 1147 Appendix 3, 4 and 5 Requirements and Associated Sections Where They Are Addressed

No.	Requirement	Relevant Section
<b>Annual Rehabilitation Plan – Appendix 3</b>		
<b>3 (a)</b>	details of the- (i) person or persons that prepared the plan; (ii) professional registrations and experience of the person or persons; (iii) timeframes of implementation of the current, and review of the previous rehabilitation activities;	Section 2



No.	Requirement	Relevant Section
3 (b)	the pertinent environmental and project context relating directly to the planned annual rehabilitation and remediation activity;	Section 3.1
3 (c)	results of monitoring of risks identified in the final rehabilitation, decommissioning and mine closure plan with a view to informing rehabilitation and remediation activities;	To be confirmed after the first implementation of the Annual Rehabilitation Plan.
3 (d)	an identification of shortcomings experienced in the preceding 12 months;	Section 4
3 (e)	<p>details of the planned annual rehabilitation and remediation activities or measures for the forthcoming 12 months; including those which will address the shortcomings contemplated in (d) above or which were identified from monitoring in the preceding 12 months, and including-</p> <p>(i) if no areas are available for annual rehabilitation and remediation concurrent with mining, an indication to that effect and motivation why no annual rehabilitation or remediation can be undertaken;</p> <p>(ii) where areas are available for annual rehabilitation and remediation concurrent with mining, annual rehabilitation and remediation activities related to previous disturbance or expected planned impacts and disturbance, as per the mine works programme, in the period under consideration, which should be tabulated and must indicate, but not necessarily be limited to,-</p> <p>(aa) nature or type of activity and associated infrastructure;</p> <p>(bb) planned remaining life of the activity under consideration;</p> <p>(cc) area already disturbed or planned to be disturbed in the period of review;</p> <p>(dd) percentage of the already disturbed or planned to be disturbed area available for concurrent rehabilitation and remediation activities;</p> <p>(ee) percentage of the already disturbed or planned to be disturbed area available as per (dd) and on which concurrent rehabilitation and remediation can be undertaken;</p> <p>(ff) notes to indicate why total available or planned to be available area differs from area already disturbed or planned to be disturbed;</p> <p>(gg) notes to indicate why concurrent rehabilitation will not be undertaken on the full available or planned to be available area;</p> <p>(hh) details of rehabilitation activity planned on this area for the period of review;</p> <p>(ii) the pertinent closure objectives and performance targets that will be addressed in the forthcoming year, which objectives and targets are aligned to the final rehabilitation, decommissioning and mine closure plan;</p> <p>(jj) description of the relevant closure design criteria adopted in the annual rehabilitation and remediation activities and the expected final land use</p>	Section 4



No.	Requirement	Relevant Section
	<p>once all rehabilitation and remediation activities are complete for the activity or aspect; and</p> <p>(iii) a site plan indicating at least the total area disturbed, area available for rehabilitation and remediation and the area to be rehabilitated or remediated per aspect or activity;</p>	
<b>3 (f)</b>	<p>a review of the previous year's annual rehabilitation and remediation activities; indicating a comparison between activities planned in the previous year's annual rehabilitation and remediation plan and actual rehabilitation and remediation implemented, which should be tabulated and as a minimum contain-</p> <p>(aa) area planned to be rehabilitated and remediated during the plan under review;</p> <p>(bb) actual area rehabilitation or remediated; and</p> <p>(cc) if the variance between planned and actual exceeds 15%, motivation indicating reasons for the inability to rehabilitate or remediate the full area; and</p>	Section 4
<b>3 (g)</b>	<p>costing, including-</p> <p>(i) an explanation of the closure cost methodology;</p> <p>(ii) auditable calculations of costs per activity or infrastructure;</p> <p>(iii) cost assumptions; and</p> <p>(iv) monitoring and maintenance costs likely to be incurred both during the period of the annual rehabilitation plan and those that will extend past the period of the final rehabilitation, decommissioning and mine closure plan, on condition that the monitoring and maintenance costs included in previous annual rehabilitation plans must be accumulated into subsequent versions of the annual rehabilitation plan until such time as the monitoring and maintenance obligation is discharged.</p>	Section 4
<b>Final Rehabilitation, Decommissioning and Mine Closure Plan – Appendix 4</b>		
<b>3 (a)</b>	<p>details of-</p> <p>(i) the person or persons that prepared the plan;</p> <p>(ii) the professional registrations and experience of the preparers;</p>	Section 2
<b>3 (b)</b>	<p>the context of the project, including-</p> <p>(i) material information and issues that have guided the development of the plan;</p> <p>(ii) an overview of-</p> <p>(aa) the environmental context, including but not limited to air quality, quantity and quality of surface and groundwater, land, soils and biodiversity; and</p>	Section 3.1



No.	Requirement	Relevant Section
	<p>(bb) the social context that may influence closure activities and post-mining land use or be influenced by closure activities and post-mining land use;</p> <p>(iii) stakeholder issues and comments that have informed the plan;</p> <p>(iv) the mine plan and schedule for the full approved operations, and must include-</p> <p>(aa) appropriate description of the mine plan;</p> <p>(bb) drawings and figures to indicate how the mine develops;</p> <p>(cc) what areas are disturbed; and</p> <p>(dd) how infrastructure and structures (including ponds, residue stockpiles etc.) develops during operations;</p>	
<p><b>3 (c)</b></p>	<p>findings of an environmental risk assessment leading to the most appropriate closure strategy, including-</p> <p>(i) a description of the risk assessment methodology including risk identification and quantification, to be undertaken for all areas of infrastructure or activity or aspects for which a holder of a right or permit has a responsibility to mitigate an impact or risk at closure;</p> <p>(ii) an identification of indicators that are most sensitive to potential risks and the monitoring of such risks with a view to informing rehabilitation and remediation activities;</p> <p>(iii) an identification of conceptual closure strategies to avoid, manage and mitigate the impacts and risks;</p> <p>(iv) a reassessment of the risks to determine whether, after the implementation of the closure strategy, the residual risk has been avoided and / or how it has resulted in avoidance, rehabilitation and management of impacts and whether this is acceptable to the mining operation and stakeholders; and</p> <p>(v) an explanation of changes to the risk assessment results, as applicable in annual updates to the plan;</p>	<p>Section 3.2 and 3.3</p>
<p><b>3 (d)</b></p>	<p>design principles, including-</p> <p>(i) the legal and governance framework and interpretation of these requirements for the closure design principles;</p> <p>(ii) closure vision, objectives and targets, which objectives and targets must reflect the local environmental and socio-economic context and reflect regulatory and corporate requirements and stakeholder expectations;</p> <p>(iii) a description and evaluation of alternative closure and post closure options where these exist that are practicable within the socioeconomic and environmental opportunities and constraints in which the operation is located;</p> <p>(iv) a motivation for the preferred closure action within the context of the risks and impacts that are being mitigated;</p>	<p>Section 3.4</p>



No.	Requirement	Relevant Section
	<p>(v) a definition and motivation of the closure and post closure period, taking cognisance of the probable need to implement post closure monitoring and maintenance for a period sufficient to demonstrate that relinquishment criteria have been achieved;</p> <p>(vi) details associated with any on-going research on closure options;</p> <p>(vii) a detailed description of the assumptions made to develop closure actions in the absence of detailed knowledge on site conditions, potential impacts, material availability, stakeholder requirements and other factors for which information is lacking;</p>	
<b>3 (e)</b>	<p>a proposed final post-mining land use which is appropriate, feasible and possible of implementation, including-</p> <p>(i) descriptions of appropriate and feasible final post-mining land use for the overall project and per infrastructure or activity and a description of the methodology used to identify final post-mining land use, including the requirements of the operations stakeholders;</p> <p>(ii) a map of the proposed final post-mining land use;</p>	Section 3.5
<b>3 (f)</b>	<p>closure actions, including-</p> <p>(i) the development and documenting of a description of specific technical solutions related to infrastructure and facilities for the preferred closure option or options, which must include all areas, infrastructure, activities and aspects both within the mine lease area and off of the mine lease area associated with mining for which the mine has the responsibility to implement closure actions;</p> <p>(ii) the development and maintenance of a list and assessment of threats and opportunities and any uncertainties associated with the preferred closure option, which list will be used to identify and define any additional work that is needed to reduce the level of uncertainty;</p>	Section 3.6
<b>3 (g)</b>	<p>a schedule of actions for final rehabilitation, decommissioning and closure which will ensure avoidance, rehabilitation, management of impacts including pumping and treatment of extraneous water -</p> <p>(i) linked to the mine works programme, if greenfields, or to the current mine plan, if brownfields;</p> <p>(ii) including assumptions and schedule drivers; and</p> <p>(iii) including a spatial map or schedule, showing planned spatial progression throughout operations;</p>	Section 3.6 and 3.7
<b>3 (h)</b>	<p>an indication of the organisational capacity that will be put in place to implement the plan, including-</p> <p>(i) organisational structure as it pertains to the plan;</p> <p>(ii) responsibilities;</p> <p>(iii) training and capacity building that may be required to build closure competence;</p>	Section 3.8



No.	Requirement	Relevant Section
3 (i)	an indication of gaps in the plan, including an auditable action plan and schedule to address the gaps;	Section 3.9
3 (j)	relinquishment criteria for each activity or infrastructure in relation to environmental aspects with auditable indicators;	Section 3.10
3 (k)	<p>closure cost estimation procedure, which ensures that identified rehabilitation, decommissioning, closure and post-closure costs, whether on-going or once-off, are realistically estimated and incorporated into the estimate, on condition that-</p> <p>(i) cost estimates for operations, or components of operations that are more than 30 years from closure will be prepared as conceptual estimates with an accuracy of <math>\pm 50</math> per cent. Cost estimates will have an accuracy of <math>\pm 70</math> per cent for operations, or components of operations, 30 or less years (but more than ten years) from closure and <math>\pm 80</math> per cent for operations, or components of operations ten or less years (but more than five years) from closure. Operations with 5 or less years will have an accuracy of <math>\pm 90</math> per cent. Motivation must be provided to indicate the accuracy in the reported number and as accuracy improves, what actions resulted in an improvement in accuracy;</p> <p>(ii) the closure cost estimation must include-</p> <p>(aa) an explanation of the closure cost methodology;</p> <p>(bb) auditable calculations of costs per activity or infrastructure;</p> <p>(cc) cost assumptions;</p> <p>(iii) the closure cost estimate must be updated annually during the operation's life to reflect known developments, including changes from the annual review of the closure strategy assumptions and inputs, scope changes, the effect of a further year's inflation, new regulatory requirements and any other material developments; and</p>	Section 3.11
3 (l)	<p>monitoring, auditing and reporting requirements which relate to the risk assessment, legal requirements and knowledge gaps as a minimum and must include-</p> <p>(i) a schedule outlining internal, external and legislated audits of the plan for the year, including-</p> <p>(aa) the person responsible for undertaking the audit(s);</p> <p>(bb) the planned date of audit and frequency of audit;</p> <p>(cc) an explanation of the approach that will be taken to address and close out audit results and schedule;</p> <p>(ii) a schedule of reporting requirements providing an outline of internal and external reporting, including disclosure of updates of the plan to stakeholders;</p> <p>(iii) a monitoring plan which outlines-</p>	Section 3.12



No.	Requirement	Relevant Section
	<p>(aa) parameters to be monitored, frequency of monitoring and period of monitoring;</p> <p>(bb) an explanation of the approach that will be taken to analyse monitoring results and how these results will be used to inform adaptive or corrective management and/or risk reduction activities; and</p>	
<b>3 (m)</b>	<p>motivations for any amendments made to the final rehabilitation, decommissioning and mine closure plan, given the monitoring results in the previous auditing period and the identification of gaps as per 2(i).</p>	N/A
<b>Environmental Risk Assessment – Appendix 5</b>		
<b>3 (a)</b>	<p>details of-</p> <p>(i) the person or persons that prepared the plan;</p> <p>(ii) the professional registrations and experience of the preparers;</p>	Section 2
<b>3 (b)</b>	<p>details of the assessment process used to identify and quantify the latent risks, including-</p> <p>(i) a description of the risk assessment methodology inclusive of risk identification and quantification;</p> <p>(ii) substantiation why each risk is latent, including why the risk was not or could not be mitigated during concurrent rehabilitation and remediation or during the implementation of the final rehabilitation, decommission and closure plan;</p> <p>(iii) a detailed description of the drivers that could result in the manifestation of the risks, to be presented within the context of closure actions already having been implemented during the execution of concurrent rehabilitation or during the implementation of the final rehabilitation, decommission and closure plan;</p> <p>(iv) a description of the expected timeframe in which the risk is likely to manifest, typically as expected years after closure, and the duration of the impact, including motivation to support these timeframes;</p> <p>(v) a detailed description of the triggers which can be used to identify that the risk is imminent or has manifested, how this will be measured and any cost implications thereof;</p> <p>(vi) results and findings of the risk assessment;</p> <p>(vii) an explanation of changes to the risk assessment results as applicable in annual updates to the plan;</p>	Section 5.1
<b>3 (c)</b>	<p>management activities, including-</p> <p>(i) monitoring of results and findings, which informs adaptive or corrective management and/or risk reduction activities;</p> <p>(ii) an assessment of alternatives to mitigate or manage the impacts once the risk has become manifested, which must be focussed on practicality as well as cost of the implementation;</p>	Section 5.2



No.	Requirement	Relevant Section
	<p>(iii) motivation why the selected alternative is the appropriate approach to mitigate the impact;</p> <p>(iv) a detailed description of how the alternative will be implemented;</p>	
<b>3 (d)</b>	<p>costing, calculated using the current value of money and no discounting or net present value calculations included in the determination of the quantum of the liability, including-</p> <p>(i) a cost estimation, which must include-</p> <p>(aa) an explanation of the closure cost methodology;</p> <p>(bb) an auditable calculations of costs per activity or infrastructure;</p> <p>(cc) cost assumptions;</p> <p>(dd) monitoring costs post closure to determine whether the risk is imminent or has manifest are to be included in the assessment as are monitoring costs likely to be incurred during the implementation of the strategy to manage or mitigate the impacts once the risk has become manifest;</p> <p>(ii) where appropriate, a differentiation between capital, operating, replacement and maintenance costs;</p> <p>(iii) cost estimates for operations, or components of operations that are more than 30 years from closure prepared as conceptual estimates within an accuracy of <math>\pm 50</math> per cent. Cost estimates will have an accuracy of <math>\pm 70</math> per cent for operations, or components of operations, 30 or less years (but more than ten years) from closure and <math>\pm 80</math> per cent for operations, or components of operations ten or less years (but more than five years) from closure. Operations with 5 or less years will have an accuracy of <math>\pm 90</math> per cent.</p> <p>Motivation must be provided to indicate the accuracy in the reported number and as accuracy improves, what actions resulted in an improvement in accuracy; and</p>	Section 5.2
<b>3 (e)</b>	<p>monitoring, auditing and reporting requirements, which must include requirements prior to the manifestation of the risk and impacts as well as those once the impacts resulting from the manifestation of the risk are realised, inclusive of the approach that will be taken to analyse monitoring results and how these results will be used to inform adaptive or corrective management and/or risk reduction activities.</p>	Section 5.2

## 2 DETAILS OF THE SPECIALIST

The details of the professionals who contributed to the preparation of the annual rehabilitation plan (ARP), final rehabilitation, decommissioning and mine closure plan (FRDCP) and environmental risk assessment (ERA) are provided in Table 2.



Table 2: Details of Specialist<sup>1</sup>

Name	Role	Qualifications / Experience	Professional Registrations
<b>Liam Whitlow</b>	Environmental Consultant (Review)	BSc Hons Environmental Management. ~25 years environmental consulting experience.	South African Council for Natural Scientific Professions - Registered Professional Natural Scientist (Environmental Science, 400148/08). Registered Environmental Assessment Practitioner (2019/222). Member of Land Rehabilitation Society of Southern Africa.
<b>Monica Niehof</b>	Environmental Consultant (Compiler)	BSc Hons Environmental Management. ~15 years environmental consulting experience.	Registered Environmental Assessment Practitioner (2024/8835).

### 3 FINAL REHABILITATION, DECOMMISSIONING AND CLOSURE PLAN (FRDCP)

According to the NEMA GNR 1147 the objective of the final rehabilitation, decommissioning and mine closure plan, which must be measurable and auditable, is to identify a post-mining land use that is feasible through-

- (a) providing the vision, objectives, targets and criteria for final rehabilitation, decommissioning and closure of the project;
- (b) outlining the design principles for closure;
- (c) explaining the risk assessment approach and outcomes and link closure activities to risk rehabilitation;
- (d) detailing the closure actions that clearly indicate the measures that will be taken to mitigate and/or manage identified risks and describes the nature of residual risks that will need to be monitored and managed post closure;
- (e) committing to a schedule, budget, roles and responsibilities for final rehabilitation, decommissioning and closure of each relevant activity or item of infrastructure;
- (f) identifying knowledge gaps and how these will be addressed and filled;
- (g) detailing the full closure costs for the life of project at increasing levels of accuracy as the project develops and approaches closure in line with the final land use proposed; and
- (h) outlining monitoring, auditing and reporting requirements.

This section of the report aims to achieve these objectives.

<sup>1</sup> According to the 2015 Financial Provisioning Regulations “Specialist” is defined as “specialist” means an independent person or persons who is qualified by virtue of his or her demonstrable knowledge, qualifications, skills or expertise in the mining, environmental, resource economy and financial fields.



### 3.1 PROJECT AND ENVIRONMENTAL CONTEXT

This section aims to provide context and focus attention on the material information and issues that have guided the development of this FRDCP. Further details on the project and environmental context can be obtained from the Basic Assessment Report.

#### 3.1.1 PROJECT CONTEXT

Please refer to the detailed description of the project as provided for in Section 2 of the BAR. The planned prospecting activities, which would require inclusion in the FRDCP are extracted and described in Section 3.1.1.1 to Section 3.1.1.4.

##### 3.1.1.1 LOCATION

Table 3 indicates the details of the project area for the proposed project including details on the project location as well as the distance from the proposed project area to the nearest towns. Refer to Table 3 and Table 4 for locality details, and below for a map depicting the location of the proposed Prospecting Right area.

Table 3: Locality details

<b>Farm Names:</b>	Please refer to Table 4 below
<b>Application Area (ha)</b>	The area is approximately 46 940.02083 hectares in extent.
<b>Magisterial District/s</b>	Kenhardt
<b>Distance and direction from the nearest town</b>	The area is located approximately 75 to 138 kilometers east of Aggeneys town and 31 to 85 kilometers south-east of Pofadder town.
<b>21 digit Surveyor General Code for each farm portion</b>	Please refer to Table 4 below

Table 4: Properties within the Application Area<sup>2</sup>

Nr.	Registered Description	Land	Magisterial District	Extent (Ha)	Title Deed/Diagram Deed	SG Code
1	Lovedale (Remaining Extent)	201	Kenhardt	8455.939081	KEQ8-14/1918	C0360000000020100000
2	Quagga- Maag (Remaining Extent)	200	Kenhardt	7648.161839	G233/1952	C0360000000020000000
3	Haartebeest-Vlei (Remaining Extent)	199	Kenhardt	7416.713163	G244/1949	C0360000000019900000
4	Adjoining Geelvloer 197 (Remaining Extent)		Kenhardt	3058.217982	KEQ4-9/1903	C0360000000019700000

<sup>2</sup> It should be noted that the initial area applied included several other farms/properties, however, as per the acceptance letter from the DMPR, those properties already had mining rights and or prospecting rights and / or applications submitted and had to be excluded from this application. The table only include properties that have been accepted as part of the application.



Nr.	Registered Description	Land	Magisterial District	Extent (Ha)	Title Deed/Diagram Deed	SG Code
5	Adjoining 197 (Portion 8)	Geelvloer	Kenhardt	1515.757637	T8709/1943	C03600000000019700008
6	Adjoining 197 (Portion 1)	Geelvloer	Kenhardt	3009.284506	T11186/1937	C03600000000019700001
7	Adjoining 197 (Portion 2)	Geelvloer	Kenhardt	1527.340039	T11189/1937	C03600000000019700002
8	Adjoining 197 (Portion 4)	Geelvloer	Kenhardt	1475.362198	T11191/1937	C03600000000019700004
9	Adjoining 197 (Portion 3)	Geelvloer	Kenhardt	3035.423072	T11190/1937	C03600000000019700003
10	Adjoining 197 (Portion 6)	Geelvloer	Kenhardt	1574.911537	T2013/1942	C03600000000019700006
11	Vaal-Kop (Remaining Extent)	225	Kenhardt	8222.909774	G62/1950	C03600000000022500000
12	Vaal-Kop 225 (Portion 1)		Kenhardt	900.000000	T53769/1984	C03600000000022500001
<b>TOTAL AREA (HA)</b>				<b>46 940.02083</b>		

The PR/EA application boundary is described by the coordinates on Table 4 . Refer to Figure 2 for the Regulation 2.2 Plan depicting the land on which the proposed Prospecting Right is to be exercised on.

Table 5: Application Area Boundary Coordinates (Projected Coordinate System: WGS\_1984\_UTM Zone\_34S)<sup>3</sup>

Point	Latitude	Longitude
0	-29.398260	20.199646
1	-29.388994	20.224534
2	-29.283340	20.133845
3	-29.381712	20.043922
4	-29.312258	20.039195
5	-29.269380	19.991219

<sup>3</sup>It should be noted that the initial area applied included several other farms/properties, however, as per the acceptance letter from the DMPR, those properties already had mining rights and or prospecting rights and / or applications submitted and had to be excluded from this application. The table and figures in this report only include properties that have been accepted as part of the application.



Point	Latitude	Longitude
6	-29.288790	19.875686
7	-29.272294	19.697904
8	-29.272299	19.685429
9	-29.300219	19.696396
10	-29.325942	19.710682
11	-29.365772	19.760775
12	-29.356909	19.840975
13	-29.361885	19.866612
14	-29.344728	19.927584
15	-29.428206	19.995880
16	-29.417777	20.010888
17	-29.445665	20.045726
18	-29.413357	20.092308
19	-29.391691	20.155961

The locality of the proposed project is shown in Figure 1 and the properties in Figure 2.

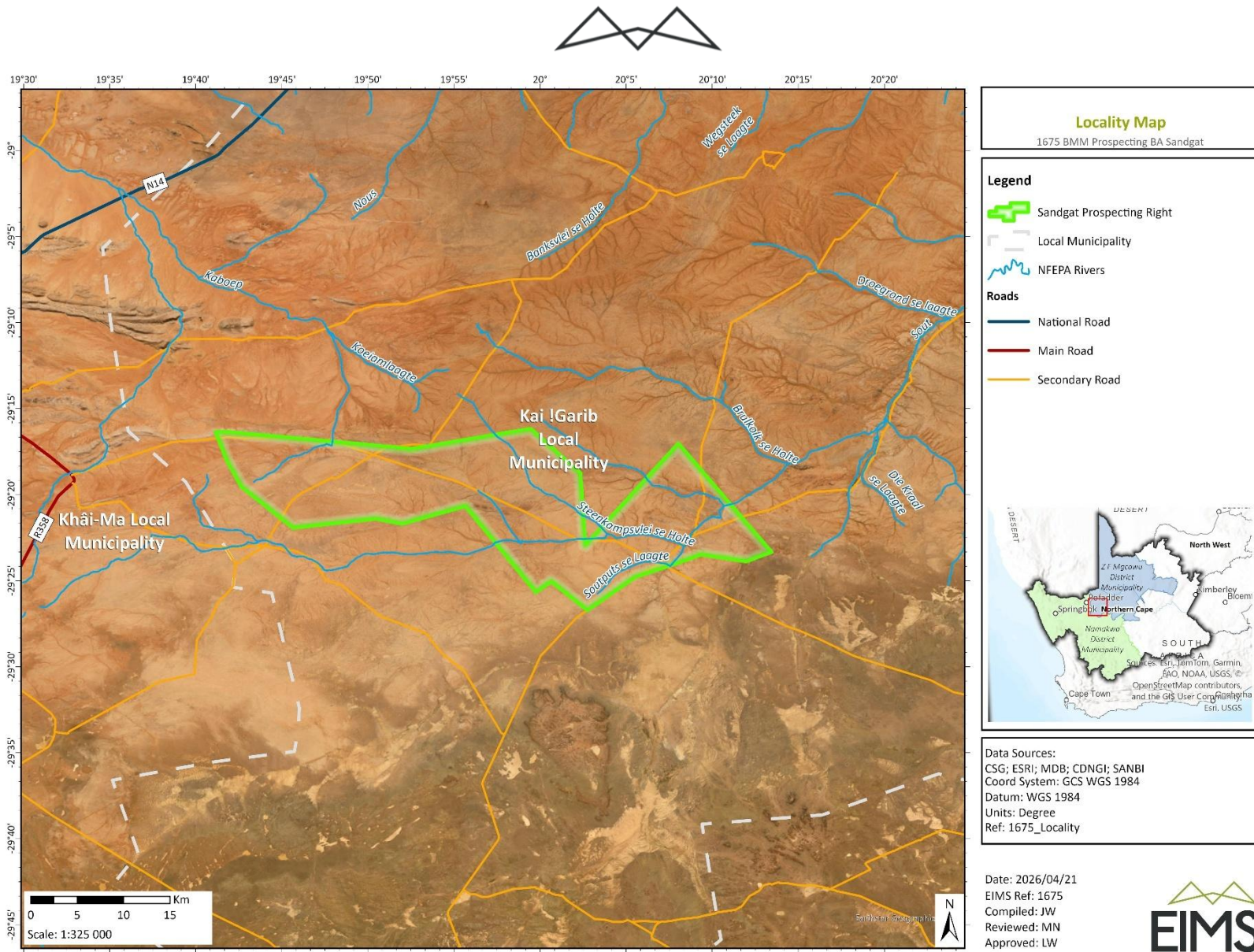
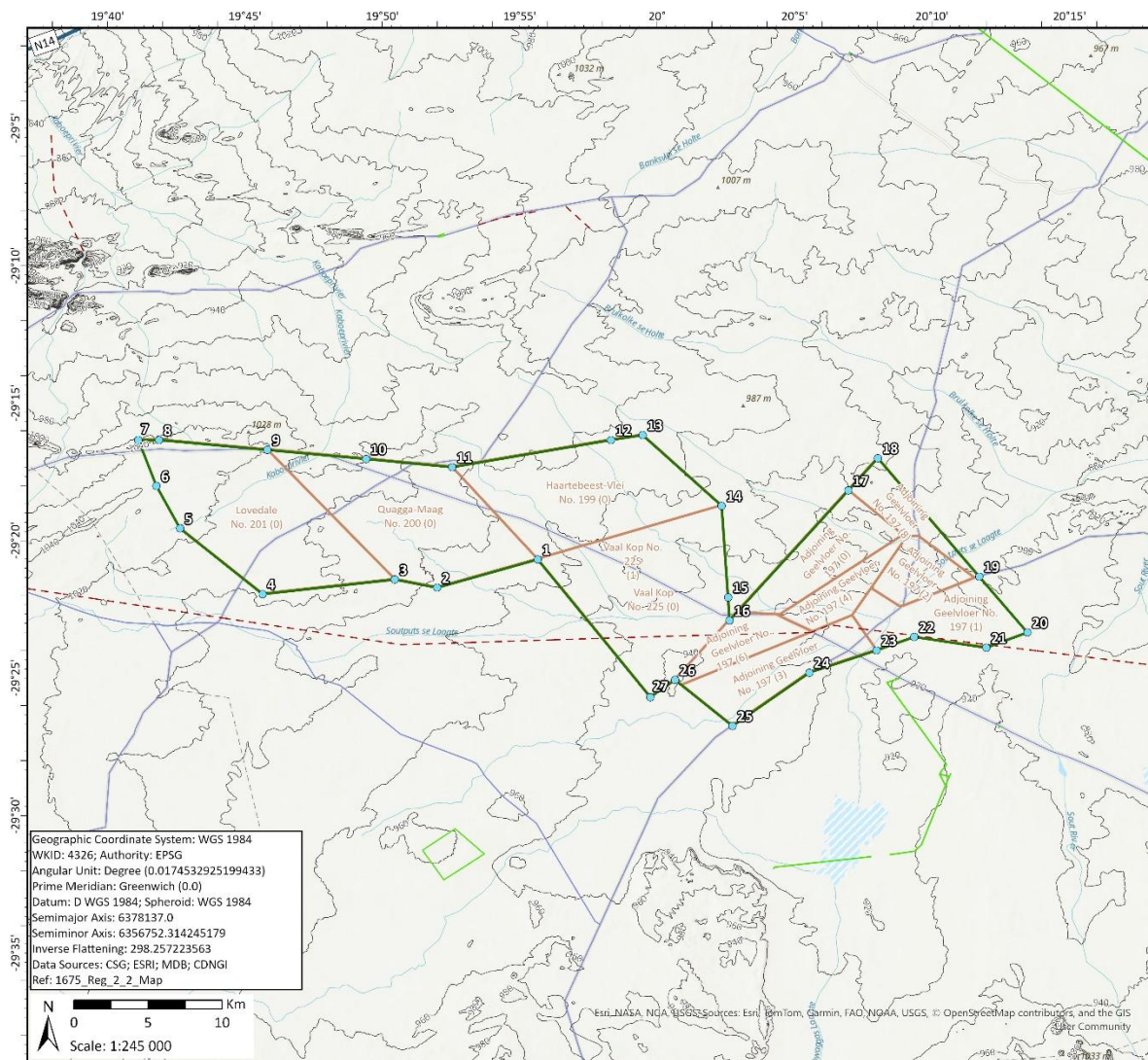
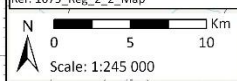


Figure 1: Locality Map



Geographic Coordinate System: WGS 1984  
 WKID: 4326; Authority: EPSG  
 Angular Unit: Degree (0.0174532925199433)  
 Prime Meridian: Greenwich (0.0)  
 Datum: D WGS 1984; Spheroid: WGS 1984  
 Semimajor Axis: 6378137.0  
 Semiminor Axis: 6356752.314245179  
 Inverse Flattening: 298.257223563  
 Data Sources: CS; ESRI; MDB; CDNGI  
 Ref: 1675\_Reg\_2\_2\_Map



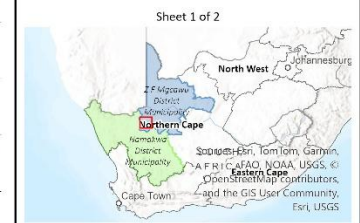
Esri, NASA, NOAA, USGS sources; Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

### MPRDA Regulation 2.2 Plan

1675 BMM Prospecting BA Sandgat

Plan prepared in accordance with Regulation 2(2) of the Regulations promulgated in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) for which application is made for a prospecting right for minerals, in terms of Section 16 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), from information supplied by the Chief Surveyor-General.

- Legend**
- Sandgat Prospecting Right (46 980.249 ha)
  - Servitude Area
  - Points
  - Directly Affected Farm Portions
  - Servitude Line
  - Roads
    - National Road
    - Secondary Road
  - Contours (20m)



Date: 2026/05/25  
 EIMS Ref: 1675  
 Compiled: JW  
 Reviewed: MN  
 Approved: LW





Point	Latitude	Longitude	Point	Latitude	Longitude
1	-29.34472899	19.92758106	15	-29.36764599	20.04306307
2	-29.36188599	19.86660906	16	-29.38170999	20.04392307
3	-29.356906	19.84097207	17	-29.30293799	20.11595507
4	-29.36576799	19.76077307	18	-29.28334399	20.13384907
5	-29.325942	19.71068207	19	-29.35512199	20.19527407
6	-29.30021599	19.69639706	20	-29.3889936	20.2245316
7	-29.27229899	19.68542407	21	-29.39826199	20.19965106
8	-29.27229799	19.69790507	22	-29.391693	20.1559633
9	-29.27834699	19.76366007	23	-29.39983499	20.13309307
10	-29.28382099	19.82347607	24	-29.41335999	20.09231306
11	-29.28878699	19.87568306	25	-29.44566899	20.04572707
12	-29.27233199	19.97208106	26	-29.41777699	20.01089207
13	-29.26937799	19.99121806	27	-29.42820399	19.99588406
14	-29.31225799	20.03919606			

Nr#	Farm Name	Farm No#	Portion No#	District Municipality
1	Lovedale 201	201	RE	ZF Mgcau
2	Quagga- Maag 200	200	RE	ZF Mgcau
3	Haartebeest- Vlei 199	199	RE	ZF Mgcau
4	Adjoining Geelvloer 197	197	RE	ZF Mgcau
5	Adjoining Geelvloer 197	197	8	ZF Mgcau
6	Adjoining Geelvloer 197	197	1	ZF Mgcau
7	Adjoining Geelvloer 197	197	2	ZF Mgcau
8	Adjoining Geelvloer 197	197	4	ZF Mgcau
9	Adjoining Geelvloer 197	197	3	ZF Mgcau
10	Adjoining Geelvloer 197	197	6	ZF Mgcau
11	Vaal- Kop 225	225	RE and Portion 1	ZF Mgcau

### MPRDA Regulation 2.2 Plan

1675 BMM Prospecting BA Sandgat

Plan prepared in accordance with Regulation 2(2) of the Regulations promulgated in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) for which application is made for a prospecting right for minerals, in terms of Section 16 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), from information supplied by the Chief Surveyor-General.

Sheet 2 of 2

Applicant: Black Mountain Mining (Pty) Ltd

Signature:



Date: 2026/05/25

EIMS Ref: 1675

Compiled: JW

Reviewed: MN

Approved: LW



Figure 2: Regulation 2.2 Plan



### 3.1.1.2 DESCRIPTION OF THE PROPOSED ACTIVITIES

Both non-invasive and invasive prospecting activities will be undertaken as part of the proposed Prospecting Work Programme (PWP). The application will follow a phased approach, where the prospecting work program is divided into several sequential phases.

Figure 1 above depicts the proposed prospecting area, the proposed areas of interest within the application area will be defined within the course of prospecting activities. This application employs a phased approach, where the work program is divided into several sequential sections. At the end of each section there will be a period of compiling, evaluating and reporting results. These results will not only determine whether the project proceeds, but also the manner in which it will go forward. Essentially, BMM will only action the next phase once satisfied with the results obtained. It is not possible to give details of the drilling program before the surveys and surface work phase 1 is completed. In the event that more information becomes available or that an ore body is located at an earlier stage, then an amended program will be put forward for the DMPR's approval.

It is anticipated that the invasive program will consist of a number of boreholes / drill sites with a footprint of approximately 300 m<sup>2</sup> each. Vegetation will be cleared at the borehole locations within the application area. Minor access tracks will be created to access the proposed borehole sites where there are no existing roads. The total length of the access routes is anticipated to be 5 000 m and the approximate width is 3m. The targeting of all drilling activities will be dependent on the results obtained during the preceding phases of prospecting, namely the geological mapping and geophysical surveying and as such it is currently not possible to include a finalised surface plan showing the intended location, extent and depth of boreholes to be completed.

No bulk sampling work is to be carried out during this prospecting program. Initial prospecting will be carried out by BMM itself, utilising its own in-house geologists to conduct and oversee the work. Drilling will be outsourced to a local drilling company, which is yet to be determined through an established procurement process. The methods detailed below will be used to investigate the prospecting area.

It is hereby noted that the different phases and timeframes of the prospecting herein envisaged are, by their nature, dependent on the results obtained during the preceding phases of such prospecting. The proposals set out in this Prospecting Work Programme are therefore made on the basis that results obtained during the preceding phases may necessitate reasonable changes and adaptations to such proposals, which will be reported as prescribed.

#### 3.1.1.2.1 SUMMARY OF ACTIVITIES

- **Non-invasive phases (Phases 1–3 & 6):** Information gathering with minimal land impact.
- **Invasive phases (Phases 4, 7 and 8):** Drilling and sampling to physically test mineralization.
- **Pre-/feasibility phases (Phases 5 and 9):** Data integration and economic evaluation to decide if mining is viable.

This sequence shows how prospecting progresses step by step—from **low-impact reconnaissance** to **advanced drilling and resource modelling**—ensuring that each stage builds on the results of the previous one. Refer to Table 6 for the sequencing and timeline of the various phases.

#### 3.1.1.2.2 DESCRIPTION OF PLANNED NON-INVASIVE ACTIVITIES

These activities do not disturb the land where prospecting will take place e.g., aerial photography, desktop studies, aeromagnetic surveys, field mapping and sampling, etc..

- Phase 1: Desktop Studies
  - Collect and compile historical exploration data.
  - Analyze existing maps and geological records.
  - Identify and rank areas with potential mineralization.
- Phase 2: Geological Field Mapping



- On-the-ground mapping of key rock formations (e.g., Bushmanland Group).
- Improve understanding of geological structures.
- Collect soil and rock samples for analysis (XRF or laboratory assays).
- Phase 3: Ground-Based Geophysics
  - Conduct semi-regional surveys using advanced tools like time-domain electromagnetics (TDEM) with SQUID sensors.
  - Supplement with techniques such as CSAMT or resistivity/IP surveys.
  - Use airborne survey data to guide ground follow-up.
- Phase 6: detailed Ground Geophysical Survey
  - Detailed Ground Geophysical Survey on individual positively mineralized targets to define possible extent.
  - Survey report detailing individual targets. Plans for drill hole intersections supported by cross sections.

#### 3.1.1.2.3 INVASIVE ACTIVITIES

These activities involve physical disturbance of the land, such as drilling and sampling, to directly test mineral targets.

##### *Drilling*

The targeting of all drilling activities will be dependent on the results obtained during the preceding phases of prospecting, namely the geological mapping and geophysical surveying and as such it is currently not possible to include a finalized surface plan showing the intended location, extent and depth of boreholes to be completed.

Diamond drilling will be of the standard PQ, HQ or NQ size. Down hole surveys will be done every 50m in each hole. Core will be marked, logged, photographed and sampled according to the standard of the applicant's logging and sampling procedures.

Percussion Rotary Air Blast (RAB) or Reverse Circulation (RC) drilling may be carried out for pre-collaring of diamond drill boreholes or for obtaining samples if significant depth of cover is encountered over particular targets.

##### *Assaying*

Rock chip / soil samples will be sent to a laboratory of the applicant's choice to be crushed, split, pulverized and assayed. Samples from core will be split using a core cutter before being sent to the laboratory for analysis.

##### *Metallurgical Test Work*

Metallurgical test work would start during phase 7 of the prospecting work programme. These tests will be done by and in consultation with a preferred and accredited Laboratory of the applicant's choice.

- Phase 4: Initial Boreholes
  - Prepare drill sites and access roads.
  - Drill diamond core boreholes to test anomalies identified in earlier phases.
  - Log, photograph, and sample cores.
  - Conduct down-hole geophysics and ground EM surveys.



- Rehabilitate drill sites after completion.
- Phase 7: Resource Continuity Drilling
  - Drill widely spaced boreholes to test the size and continuity of mineralization.
  - Perform sampling, assaying, and metallurgical test work.
  - Apply quality assurance and control protocols.
  - Rehabilitate sites and integrate data.
- Phase 8: Infill Drilling for Resource Definition
  - Drill closer-spaced boreholes to refine grade and tonnage estimates.
  - Conduct geotechnical drilling for mine design considerations.
  - Continue sampling, assaying, and metallurgical test work.
  - Rehabilitate sites and integrate results into resource models.

#### 3.1.1.2.4 PRE-/FEASIBILITY STUDIES

These phases evaluate whether the identified resource has economic potential and justify moving toward mine development.

- Phase 5: Data Compilation & Modelling
  - Integrate geological, geophysical, and drilling data.
  - Build 3D models of mineralized zones.
  - Rank targets based on mineralization potential.
- Phase 9: Desktop Pre-Feasibility Study
  - Use inferred resource data to estimate tonnage and grade.
  - Conduct detailed 3D modelling of ore bodies.
  - Perform risk assessments to determine if a full feasibility study is warranted.
  - Consider funding models and project economics.



Table 6: Proposed duration of prospecting phases and associated activities.

Phase	Activity (what are the activities that are planned to achieve optimal prospecting)	Skill(s) required (refers to the competent personnel that will be employed to achieve the required results)	Timeframe (in months) for the activity)	Outcome (What is the expected deliverable, e.g. Geological report, analytical results, feasibility study, etc.)	Timeframe for outcome (deadline for the expected outcome to be delivered)	What technical expert will sign off on the outcome? (e.g. geologist, mining engineer, surveyor, economist, etc.)
1	Non-Invasive Prospecting Desktop Study: Literature Survey / Review	Geologist	Month 1-12	Initial geological targeting report supported by historical records and existing data.	Month 12	Geologist
2	Non-Invasive Prospecting Geological Field Mapping	Geologist & field crew	Month 6-12	Detailed geological targeting report accompanied by maps & plans of ground truthing of initial geological targeting.	Month 12	Geologist
3	Non-Invasive Prospecting Semi-regional Ground Geophysical Survey	Geophysicist / Geologist / field crew	Month 12-24	Survey report detailing possible targets for further exploration, report supported by maps, plans & cross sections.	Month 24	Geophysicist
4	Invasive Prospecting Exploration Boreholes (16 RAB holes – 2400m; 4 Diamond Drill (DD) holes – 2000m)	Geologist / drill rig team / field crew / laboratory technicians	Month 24-34	Borehole cored data & RAB data: lithological logs, geophysical down hole surveys, assay results for mineralized intercepts.	Month 34	Geologist



Phase	Activity (what are the activities that are planned to achieve optimal prospecting)	Skill(s) required (refers to the competent personnel that will be employed to achieve the required results)	Timeframe (in months) for the activity)	Outcome (What is the expected deliverable, e.g. Geological report, analytical results, feasibility study, etc.)	Timeframe for outcome (deadline for the expected outcome to be delivered)	What technical expert will sign off on the outcome? (e.g. geologist, mining engineer, surveyor, economist, etc.)
5	Non-Invasive Prospecting Compilation, interpretation and modeling of data	Geologist / Geophysicist	Month 34-36	Modelling of data. Interpretation and 3D modeling of potential deposit. Generation & ranking of mineralized targets for further exploration work.	Month 36	Geologist
6	Non-Invasive Prospecting Detailed Ground Geophysical Survey on individual positively mineralized targets to define possible extent	Geophysicist / Geologist / field crew	Month 36-42	Survey report detailing individual targets. Plans for drill hole intersections supported by cross sections.	Month 42	Geophysicist
7	Invasive Prospecting Boreholes to confirm continuity of mineralization & potential deposit size (20 DD holes – 8000m)	Geologist / drill rig team / field crew / laboratory technicians	Month 42-48	Widely spaced borehole cored data: lithological logs, geophysical down hole surveys, assay results for mineralized intercepts, metallurgical test work.  Risk assessment study to advance to next phase.	Month 48	Geologist



Phase	Activity (what are the activities that are planned to achieve optimal prospecting)	Skill(s) required (refers to the competent personnel that will be employed to achieve the required results)	Timeframe (in months) for the activity)	Outcome (What is the expected deliverable, e.g. Geological report, analytical results, feasibility study, etc.)	Timeframe for outcome (deadline for the expected outcome to be delivered)	What technical expert will sign off on the outcome? (e.g. geologist, mining engineer, surveyor, economist, etc.)
8	Invasive Prospecting Resource definition drilling (40 DD holes – 16000m)	Geologist / drill rig team / field crew / laboratory technicians	Month 48-60	Closely spaced borehole cored data: lithological logs, geophysical down hole surveys, assay results for mineralized intercepts, metallurgical test work.  Resource estimation work producing an Inferred Mineral Resource.	Month 60	Geologist
9	Non-Invasive Prospecting Analytical Desktop Pre-Feasibility Study	Economic Geologist / Mining Geologist	Month 54-60	Geological & Pre-feasibility reports, maps & plans.  Risk assessment study to determine if a full feasibility is warranted.	Month 60	Geologist or other professionally qualified persons.



### 3.1.1.3 LISTED AND SPECIFIED ACTIVITIES

Table 7 contains a summary of the listed and proposed prospecting activities and features, that has been considered as part of the calculations in this report.

Table 7: A summary of the listed and proposed prospecting activities and features.

Name of Activity	Aerial extent of the Activity	Listed Activity	Applicable Listing Notice	Waste Management Authorisation
<b>Any activity including the operation of that activity which requires a prospecting right in terms of section 16 of the Mineral and Petroleum Resources Development Act, as well as any other applicable activity as contained in this Listing Notice or in Listing Notice 3 of 2014, required to exercise the prospecting right.</b>	46 940.02 ha	X	GNR 983 Activity 20	N/A
<b>Desktop Study: Literature Survey / Review / acquisition of data</b>	N/A	N/A	N/A	N/A
<b>Geological field mapping</b>	46 940.02 ha	N/A	N/A	N/A
<b>Semi-regional Ground Geophysical Surveys</b>	46 940.02 ha	N/A	N/A	N/A
<b>Target Exploration Boreholes: 20 drill sites, each site covering a total area of 300 m<sup>2</sup>.</b>	6 000 m <sup>2</sup> (0.6 ha)	X	GNR 983 Activity 20 GNR 985 Activity 12 g ii	N/A
<b>Data Compilation</b>	N/A	N/A	N/A	N/A
<b>Detailed Ground Geophysical Surveys</b>	46 940.02 ha	N/A	N/A	
<b>Environmental Screening by ECO</b>	46 940.02 ha	N/A	N/A	N/A
<b>Ablutions - Chemical Toilets</b>	5 m <sup>2</sup>	N/A	N/A	N/A
<b>Temporary Fuel storage</b>	5 m <sup>2</sup> less than 80 cubic metres	N/A	N/A	N/A
<b>Sample storage (Existing BMM exploration office. No new infrastructure to be constructed)</b>	N/A	N/A	N/A	N/A
<b>Access Route (Mostly existing roads to be utilised. Access tracks will be made where there are no existing routes.)</b>	5000 m <sup>2</sup> (0.5 ha)	X	GNR 985 Activity 12 g ii	N/A



Name of Activity	Aerial extent of the Activity	Listed Activity	Applicable Listing Notice	Waste Management Authorisation
<b>Approximate total length : 5000 m Approximate width: 3m)</b>				
<b>Temporary general waste storage (General/domestic waste - Wheelie bin)</b>	3m <sup>2</sup> less than 100 cubic metres	N/A	N/A	N/A
<b>Temporary hazardous waste storage (Hazardous waste – Sealed Wheelie bin)</b>	3m <sup>2</sup> less than 100 cubic metres	N/A	N/A	N/A
<b>Compilation of geological plans</b>	N/A	N/A	N/A	N/A
<b>Undertake rehabilitation of drill sites as per the rehabilitation plan (Drill sites + Access tracks)</b>	13800 m <sup>2</sup> (1.38 ha)	N/A	N/A	N/A
<b>Monitoring of rehabilitation efforts</b>	13800 m <sup>2</sup> (1.38 ha)	N/A	N/A	N/A

### 3.1.2 ENVIRONMENTAL AND SOCIAL CONTEXT

The description and definition of the pre-prospecting environmental context is critical to ensure that the ultimate closure objectives and associated end land-use are achieved. In this regard, please refer to Section 7 of the BAR for a detailed description of the receiving environment applicable to this specific project. Based on the description of the receiving environmental and social context, this FRDCP is based on the understanding that no prospecting activities will be undertaken within the following constraint areas:

- Watercourses and Wetlands;
- Heritage sites or features;
- Existing servitudes for powerlines; and
- Residential Areas.

The description of the baseline environment (on site and surrounding) was obtained from the studies undertaken by the specialist team and in conjunction with EIMS. All specialist studies undertaken for the proposed project are included as supporting technical appendices to the BAR. The key environmental aspects related to the application area are summarised in the remainder of this Section.

#### 3.1.2.1 CLIMATE AND WEATHER

The area experiences late summer/early autumn rainfall and very variable year to year. The mean annual precipitation for the area ranges between 70 to 200 mm, west to east, respectively. The area also experiences frequent frost which ranges from around 10 days per year in the northwest to about 35 days in the east. The mean maximum and minimum monthly temperatures range from 40.6 °C and – 3.7 °C for January and July respectively (Mucina & Rutherford, 2006).



### 3.1.2.2 GEOLOGY, SOILS AND LAND CAPABILITY

The geology of the area includes recent (Quaternary) alluvium, calcrete, superficial deposits of the Kalahari group, extensive Palaeozoic diamictite of the Dwyka group, gneisses and metasediments of Mokolian age. The area is characterised by land type Ag and Ae, with red-yellow apedal soils forms. Refer to Figure 3.

According to the land type database (Land Type Survey Staff, 1972 - 2006) the assessment area to be focused on mainly falls within the Ag 3, Ag 61, Ag 25 and Ai 29 land types (). The Ag 3, Ag 61, Ag 25 land types consist of Hutton and Mispah soil forms with the occurrence of other soils and rocky areas within the landscape. The Ai 29 land types consist of Clovelly and Oakleaf soil forms according to the Soil classification working group (1991), with the occurrence of other soils and rocky areas within the landscape. The Ag land types commonly have red and yellow apedal, freely drained soils. These soils are red, have high base status < 300 mm deep. The Ai land types are characterised with red- yellow apedal, freely drained, yellow , high base status usually < 15% clay. Refer to Figure 4.

Three (3) representative soil forms identified within the proposed project area include the Clovelly, Oakleaf and Mispah soil forms (Figure 5). Based on the verified baseline findings, the proposed Sandgat Prospecting area was found to be dominated by shallow soil profiles. Such profiles are considered to have a low suitability, due to their depth restrictive for root penetration that extensively inhibits agricultural activities.

Furthermore, the proposed prospecting area is predominated with semi-impermeable to impermeable Mispah soil forms, with other areas characterised with Oakleaf and Clovelly soil forms. The Mispah soil form has an orthic topsoil on top of a hard rock layer below. The Oakleaf soil form consists of an orthic topsoil on top of a thick neocutanic subsoil horizon. The Clovelly soil form comprises of an orthic topsoil on top of a yellow brown apedal subsoil that is underlain by a lithic horizon. The Mispah soils are characterised by shallow restrictive depth, with an impermeable underlying parent material. Due to their restricted permeability, Mispah soils have limited root penetration and water movement, which inhibits crop production. Consequently, these soils have a low sensitivity and low productivity, suitable for grazing and supporting natural veld vegetation. The Oakleaf and Clovelly soil forms are characterised by apedal soils with freely drained upper horizons and restrictive underlying horizon. These soils are mostly suitable for shallow rooted crops and is considered to have a low to moderate agricultural use depending on the climatic limitations.

Land capability is defined as the combination of the slope class and soil morphological properties (i.e. topsoil texture, profile depth and permeability class of the upper soil layers). Accordingly, following Smith, (2006) which the national DAFF, (2017) land capabilities protocols were further expanded from, the above-mentioned identified soil forms are restricted to land capability classes IV (i.e. Clovelly and Oakleaf soil form) categorised by LC 6-7 (Low Moderate) and land capability VI (i.e. Mispah soil forms) categorised by LC 1-5 (Very low to Low). The baseline soil land capability was aligned and compared to the National Land Capability data (DAFF, 2017). A climate capability level 8 has been assigned to the area given the low Mean Annual Precipitation (MAP) and the high Mean Annual Potential Evapotranspiration (MAPE) rates.

Land potential is defined as the combination of the calculated land capability, the determined climate class of the area and the current land use activities. By using the determined land capability for the most sensitive soil (Clovelly and Oakleaf soil form) and the determined climate capability, a land potential of "L6" was calculated. Furthermore, the calculated land potential for less sensitive soils (i.e. Mispah soil forms) is land potential L7. According to Smith (2006), the "L6" land potential is characterised by very restricted potential with regular and or severe limitations due to soil, slope, temperature or rainfall. The "L7" land potential level is characterised by a low potential with a severe limitation due to soil, slope, temperatures, or rainfall. The areas associated with the "L6 and L7" land potentials are considered to be non-arable (Figure 6). Therefore, the proposed project area falls predominately on non-arable soils.

The following land potential levels have been determined:

- Land potential level 6 (this land potential is characterised by very restricted potential. Regular and/ or severe limitations due to soil, slope, temperatures or rainfall). Non-arable; and



- Land potential level 7 (this land potential is characterised by low potential. Severe limitations due to soil, slope, temperatures or rainfall). Non-arable.

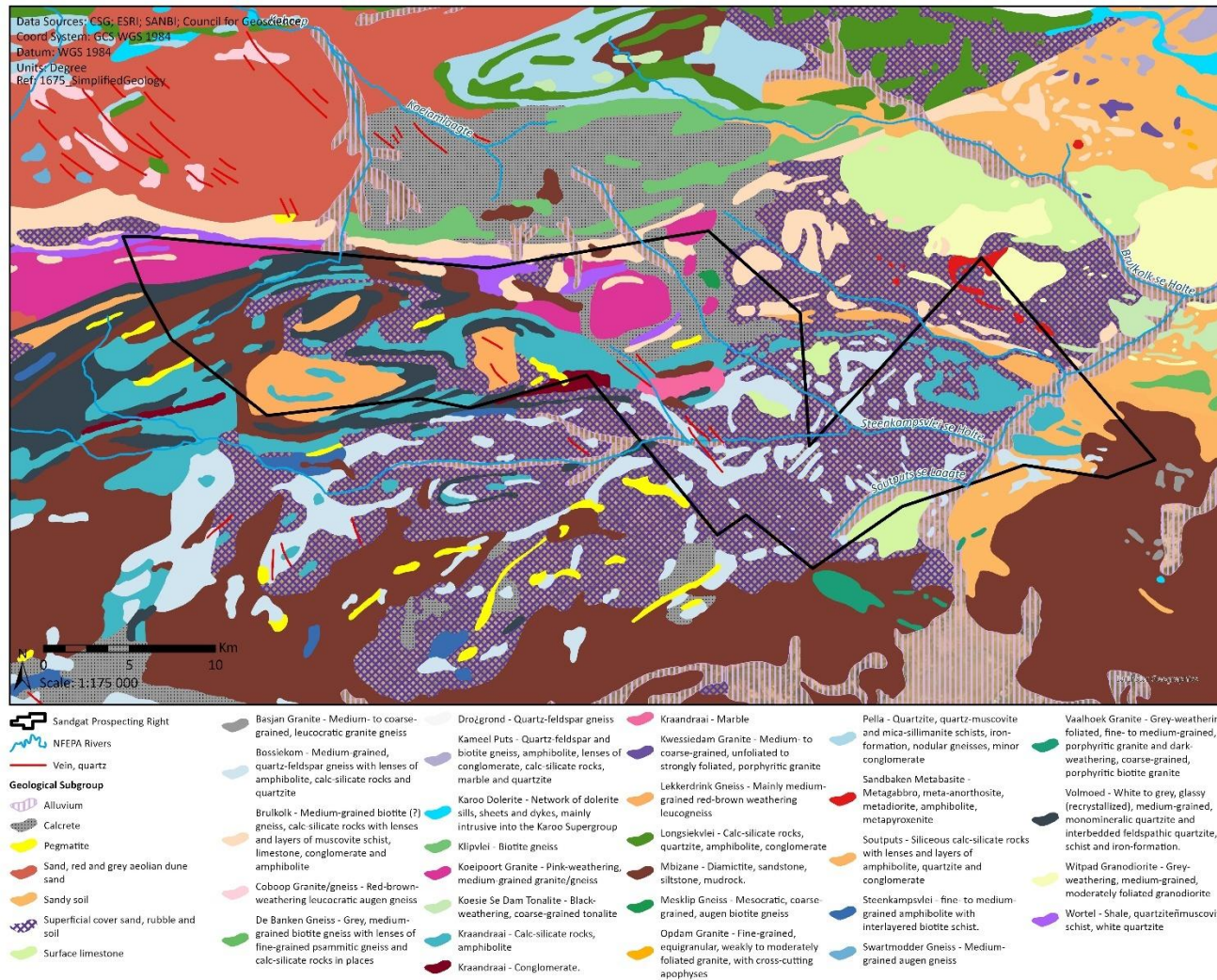


Figure 3: Simplified geology

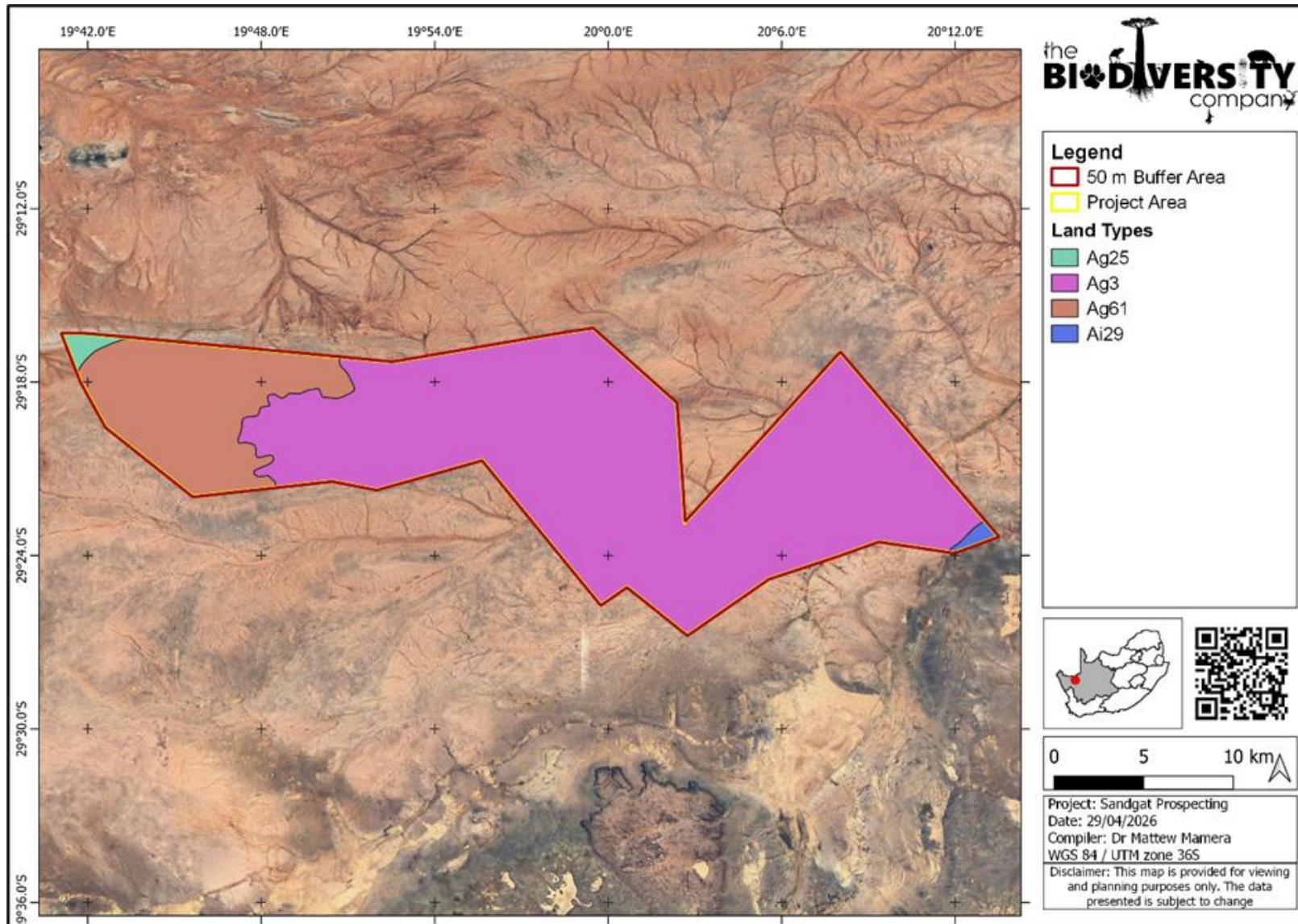


Figure 4: Land Types (The Biodiversity Company, 2026)

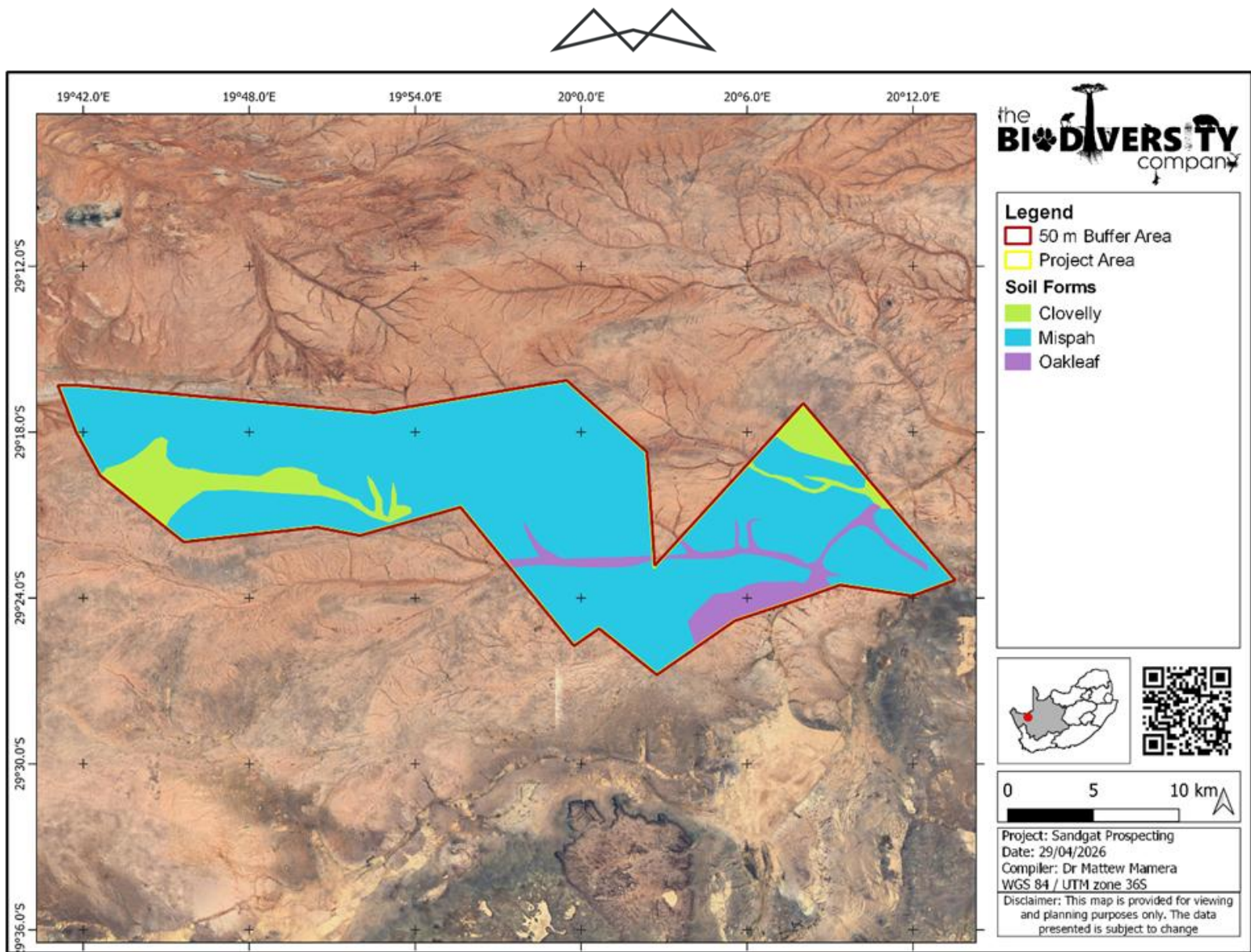


Figure 5: Soil Forms (The Biodiversity Company, 2026)

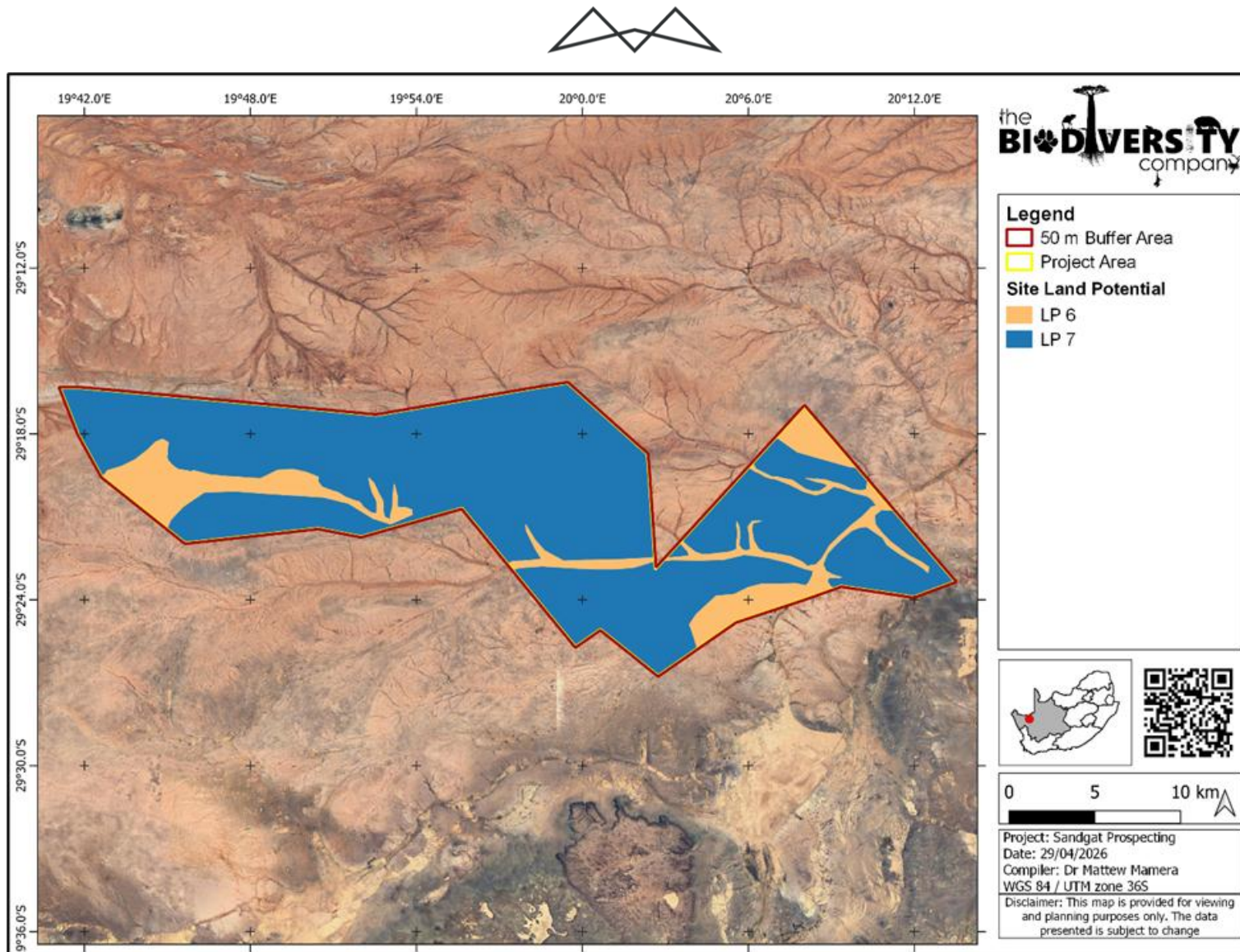


Figure 6: Land potential (The Biodiversity Company, 2026)



### 3.1.2.3 GROUNDWATER

From a hydrogeological perspective, the bedrock units within the study area are characterised by low primary porosity, with groundwater occurrence restricted to secondary features such as fractures, joints, foliation planes and shear zones (Viljoen et al., 2010). Groundwater movement is structurally controlled, with shear zones and well-developed fracture networks representing the most significant conduits due to their enhanced permeability and connectivity. In particular, groundwater is closely associated with fracturing and shearing within the metamorphic basement, as well as weathered zones within gneisses and schists.

The presence of major shear zones associated with the Pofadder Lineament is therefore considered to be the primary control on groundwater occurrence within the study area. These structurally weakened zones represent the most favourable targets for groundwater development, owing to increased fracturing and hydraulic connectivity. In contrast, the surrounding metamorphic and granitic units are expected to exhibit limited groundwater potential unless intersected by such structural features.

The overlying sediments of the Dwyka Group generally comprise low permeability diamictites and are not expected to constitute significant aquifers. Similarly, dolerite intrusions may locally influence groundwater flow, either acting as barriers to movement or, where sufficiently fractured, enhancing permeability.

#### 3.1.2.3.1 AQUIFER YIELD

According to the 1:500 000 scale hydrogeological map (DWAF, 2000), the study area is predominantly underlain by metacalcareous rocks (calc-silicate gneisses). These rocks typically occur as banded units, often interlayered with quartzite and schist. Groundwater occurrence is largely dependent on secondary permeability, associated with fractures and shear zones. Figure 7 depicts the relative site position overlaid on the Springbok 2916-hydrogeological map. The study area is therefore characterised predominantly by a fractured aquifer system, with localised occurrences of intergranular and fractured aquifers toward the western extent of the site. Based on the 1:500 000 scale hydrogeological map, both aquifer types are associated with regional average borehole yield indications of 0.1 to 0.5 L/s. Figure 8 depicts the principal groundwater occurrence of the study area.

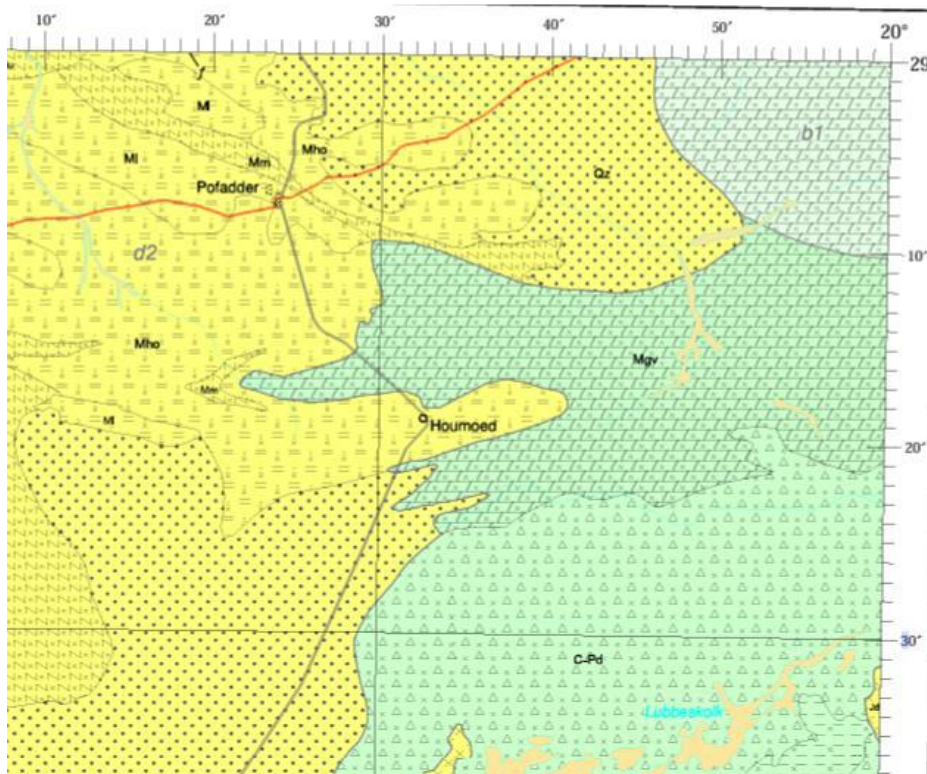


Figure 7: 1:500 000 scale hydrogeological map Springbok 2916 (DWAF, 2000)

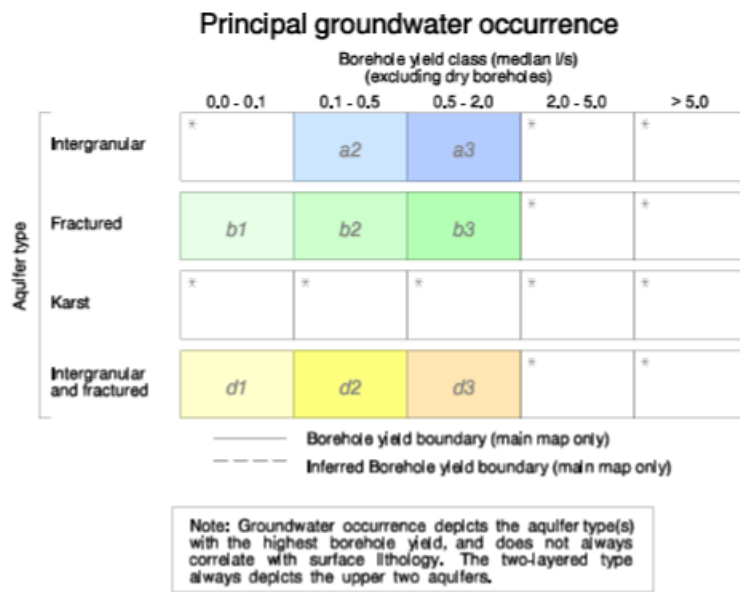


Figure 8: 1:500 000 scale hydrogeological map Springbok 2916, Principal Groundwater Occurrence (DWAf, 2000).

### 3.1.2.3.2 AQUIFER RECHARGE

As part of the desk study, the Vegter Groundwater Recharge Map (Vegter, 1995) provides a regional context of natural groundwater recharge potential. This map, developed for South Africa, uses long-term climatic, geological, and hydrological data to estimate average annual recharge rates across the country. Recharge values are expressed in mm/yr of mean annual precipitation (MAP) and are influenced by factors such as rainfall intensity, evapotranspiration, soil type, vegetation cover, and underlying geology.

Recharge estimates by Vegter indicate values in the order of 0.1 to 3 mm/a for the study area. Groundwater recharge estimates derived from the Groundwater Resource Assessment Phase 2 (GRA2) similarly indicate extremely low recharge, with values approaching negligible levels (0 mm/yr) within the area (DWS, 2005). Taking this into account, the recharge is estimated to range between approximately 0% and 3.6% of the average mean annual precipitation (84 mm/yr). Such low recharge values are considered typical for arid environments. In addition, high evaporation rates characteristic of the region further reduces the proportion of rainfall contributing to groundwater recharge.

While the Vegter recharge map is useful for broad-scale assessments and comparative analysis between regions, it is intended as a regional-scale tool. Study area-specific recharge rates may differ significantly due to localised conditions such as land use changes, aquifer properties, and artificial recharge or abstraction impacts. Consequently, the map is best used as a screening-level indicator during the scoping phase, with study area-specific measurements and modelling recommended for accurate recharge estimation. Figure 9 depicts the relative position of the study area relative to the estimated recharge.

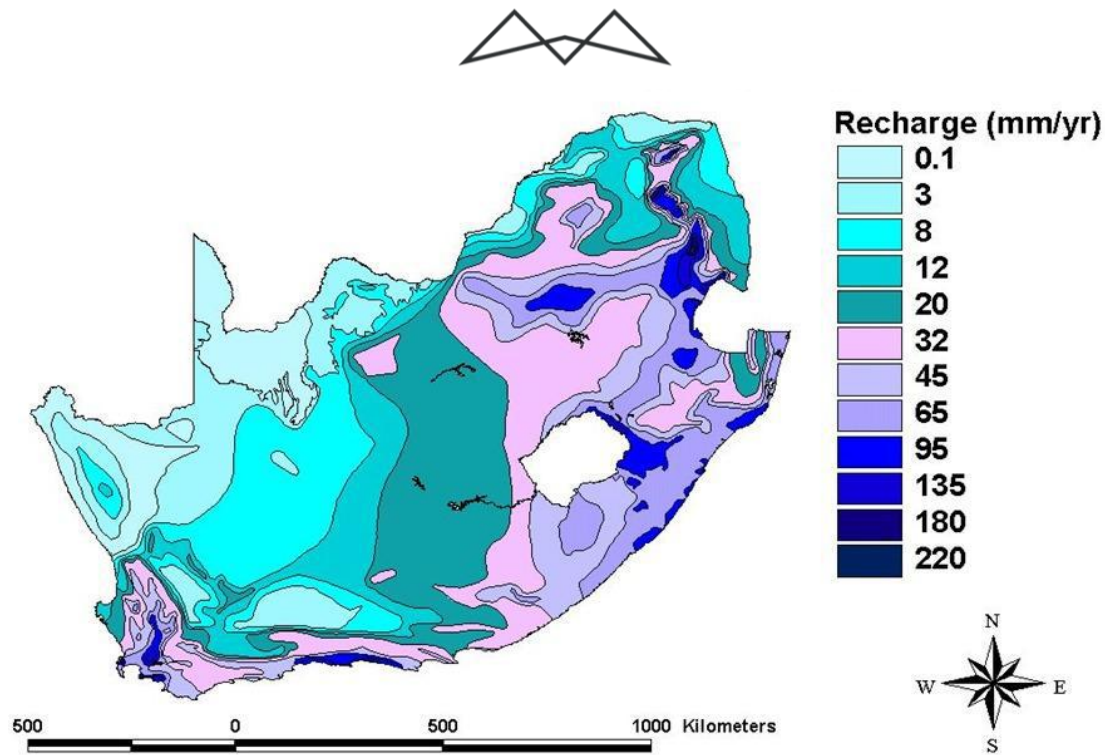


Figure 9: Vegter,1995, Recharge Map

#### 3.1.2.3.3 AQUIFER QUALITY

Electrical Conductivity (EC) reflects the groundwater’s ability to conduct an electrical current and is directly proportional to the concentration of dissolved ions present in the water. It serves as a useful indicator of groundwater quality.

According to the 1:500 000 scale groundwater quality map (DWA, 2012), EC values range between 150 and 370 mS/m in the western extent of the study area, corresponding to ‘acceptable’ groundwater quality. These values increase to approximately 370 to 520 mS/m across the central and eastern portions, indicative of ‘poor’ (brackish) groundwater quality.

To more accurately characterise groundwater quality within the local area, groundwater samples should be collected from any available boreholes or water points within and around the Study area and submitted for laboratory analysis. If no boreholes are currently present, the installation of monitoring boreholes should be considered to enable representative sampling.

In addition, isotopic analysis may be considered to assess potential groundwater-surface water interactions, particularly in relation to the non-perennial drainage lines. Such analyses would assist in evaluating the degree of hydraulic connectivity and the potential impacts of activities such as dewatering on the local surface water system, and support any potential water use licensing process.

#### 3.1.2.3.4 GROUNDWATER FLOW DIRECTIONS

In natural, undeveloped settings, groundwater flow generally follows the hydraulic gradient from areas of higher groundwater head toward areas of lower head, which often broadly reflects surface topography. In fractured hard-rock environments, however, groundwater flow may also be significantly influenced by geo-logical and structural controls such as fractures, faults, foliation planes, and shear zones. As a result, ground-water flow patterns do not necessarily mirror surface drainage or topographic gradients.

Within the study area, groundwater flow is therefore expected to be influenced by a combination of topography and structural features. Given the fractured nature of the underlying bedrock, structurally controlled flow along preferential pathways such as fractures and shear zones associated with the regional west-east Pofadder



Lineament is deemed likely. Local drainage features may also act as zones of focused recharge or discharge during and after rainfall events, particularly where these intersect with structurally weakened zones.

At this stage, however, the available desktop information is insufficient to determine site-specific groundwater flow directions with confidence. No representative set of static groundwater level measurements is available across the study area to define groundwater heads or hydraulic gradients, and the current interpretation should therefore be regarded as conceptual only. To improve accuracy in the inferred groundwater flow direction, static groundwater levels should be measured across the study area and surrounding area during any future field-based hydrogeological assessment

#### 3.1.2.3.5 AQUIFER VULNERABILITY CLASSIFICATION

The underlying aquifer was classified in accordance with the South African Aquifer System Management Classification framework developed by Parsons (1995), which continues to serve as the national standard for assessing the significance of groundwater resources. This framework offers a strategic basis for the sustainable management and protection of aquifer systems by considering their hydrogeological properties, yield potential, and socio-economic value. Based on the available data, the aquifer beneath the study area is classified as a Minor Aquifer. Such aquifers generally exhibit moderate yields sufficient for localised water supply but are not regarded as significant on a regional scale. Nevertheless, they warrant protection in cases of local dependency or heightened environmental sensitivity.

According to the National Aquifer Vulnerability Map of South Africa (DWS, 2013), the aquifer system underlying the project area is classified as having Least Vulnerability. This rating indicates that the aquifer is only vulnerable to conservative pollutants in the long term when continuously discharged or leached.

As per the National Aquifer Susceptibility Map of South Africa (DWS, 2013), the aquifer underlying the project area is assigned a Low Susceptibility rating. This suggests a low potential for contamination from surface or near-surface sources, highlighting the importance of implementing appropriate management and mitigation measures to safeguard groundwater quality.

The Groundwater Quality Management (GQM) Index, developed by the Water Research Commission (WRC) and the former Department of Water Affairs and Forestry (DWAF) in 1995, forms part of South Africa's national framework for aquifer system management classification. Despite its name, the index does not assess water quality, but rather the management importance of groundwater resources based on aquifer characteristics, yield potential, and socio-economic reliance.

The GQM Index supports the strategic categorisation of aquifers and informs decisions related to groundwater protection, development, and monitoring priorities. It remains a key tool in implementing sustainable groundwater management under the National Water Act (Act 36 of 1998). Based on the GQM Index, the aquifer underlying the Study area requires Low Level Protection.

#### 3.1.2.3.6 SITE SPECIFIC INFORMATION

To determine whether there are any groundwater users in the area that may be affected by activities within the study area, a database search was conducted around the property boundary by the geohydrologist. National databases, including the National Groundwater Archive (NGA) and the Water Use Authorisation and Registration Management System (WARMS) that contain groundwater information was reviewed and analysed. These resources provide data on borehole positions, groundwater chemistry and yield, when available.

The NGA database identified 84 boreholes in and around the study area and within a 1 km radius thereof, with only three (3) groundwater level measurements and one (1) discharge value recorded. The available data indicates groundwater levels ranging from approximately 15 to 45 metres below ground level (mbgl), recorded between 1990 and 1996. A single discharge value of approximately 2 L/s was recorded for borehole 2919BD00030.

Assessment of the WARMS Database showed no active WARMS registrations in proximity to the study area. The nearest WARMS point (registered water user) is situated 5 km north of the study area boundary.



#### 3.1.2.4 SURFACE WATER

The project area falls within the Vaal-Orange Water Management Area (WMA) (previously the Orange WMA) (DWS, 2023), the Nama-Karoo Ecoregion. The Project Area of Influence (PAOI) overlaps three quaternary catchments: D81G, D81F and D53G (Figure 10). Desktop information for the Sub-Quaternary Reaches (SQRs) associated with the PAOI was obtained from the DWS (2014). The PAOI falls within the Kaboep River, Steenkampsvlei se Holte River and Soutputs River SQRs as well as the Steenkampsvlei se Holte River Tributary and Soutputs se Laagte River Tributary SQR which will from henceforth be referred to as SVH Tributary and SL Tributary respectively. No SQR information or catchment impacts is available for all the rivers.

According to the Strategic Water Source Areas (SWSA) of South Africa, Lesotho and Swaziland, the PAOI is not located within any SWSAs for surface water or groundwater.

The Northern Cape Biodiversity Spatial Plan (NCBSP) (2024), developed by the Northern Cape Department of Environment and Nature Conservation (DENC) in collaboration with SANBI, provides the latest spatial framework for biodiversity conservation in the province. This plan updates and replaces the 2016 Northern Cape CBA Map, aiming to guide sustainable land use and inform environmental decision-making in line with national biodiversity legislation. The BSP defines the following categories: Protected Areas, Critical Biodiversity Areas (CBA), subdivided into CBA 1 and CBA 2, and Ecological Support Areas (ESA). The PAOI overlaps with Critical Biodiversity Areas 1 and 2.

According to the NBA, the PAOI overlaps with the Kaboep River, the Steenkampsvlei se Holte River and Tributary, the Soutputs se Laagte River and Tributary, as well as depression wetlands (Figure 11).

According to the SAIIE dataset, the rivers within the PAOI are classified as 'Endangered' and the wetlands as 'Critically Endangered'. The project area was also superimposed on the aquatic ecosystem protection level map to assess the protection status of aquatic ecosystems associated with the development. According to the SAIIE dataset, The PAOI does not intersect with any protected rivers and wetlands (Figure 12).

According to the National Freshwater Ecosystem Priority Areas (NFEPA) dataset, the PAOI intersect five rivers (Kaboep River, Steenkampsvlei se Holte River and Tributary, and Soutputs se Laagte River and Tributary) which are classified as NFEPA rivers. Additionally, the PAOI overlaps with the FEPA area (Figure 10).

According to the protected area spatial datasets from SAPAD (2025) and SACAD (2025), the PAOI does not overlap with any Protected or Conservation Areas. According to the protected area spatial datasets from SAPAD (2025, Q3) and SACAD (2025, Q3), at the nearest point, the PAOI is situated approximately 50 km east of the Gamsberg Nature Reserve.

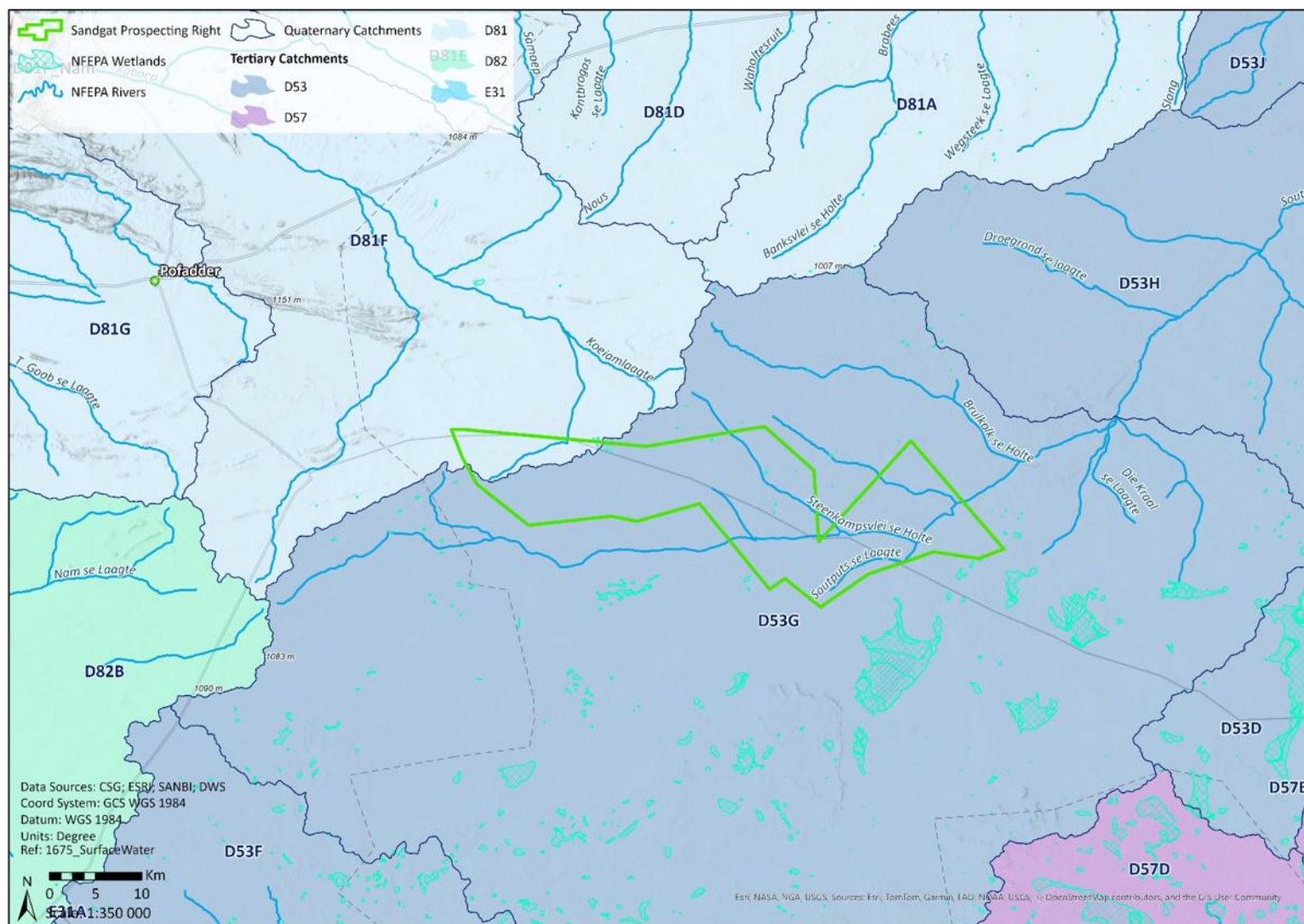
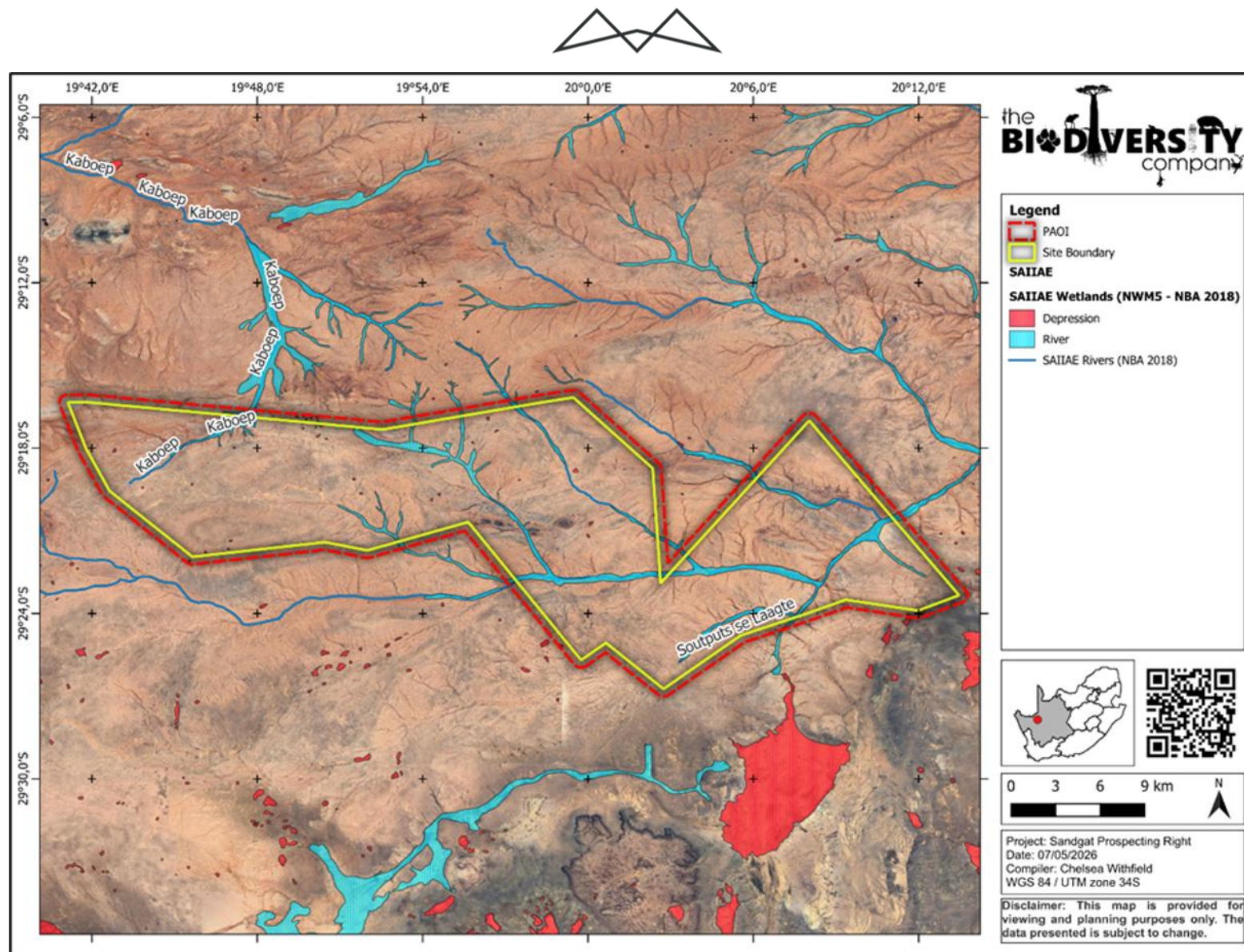


Figure 10: Surface Water Map.



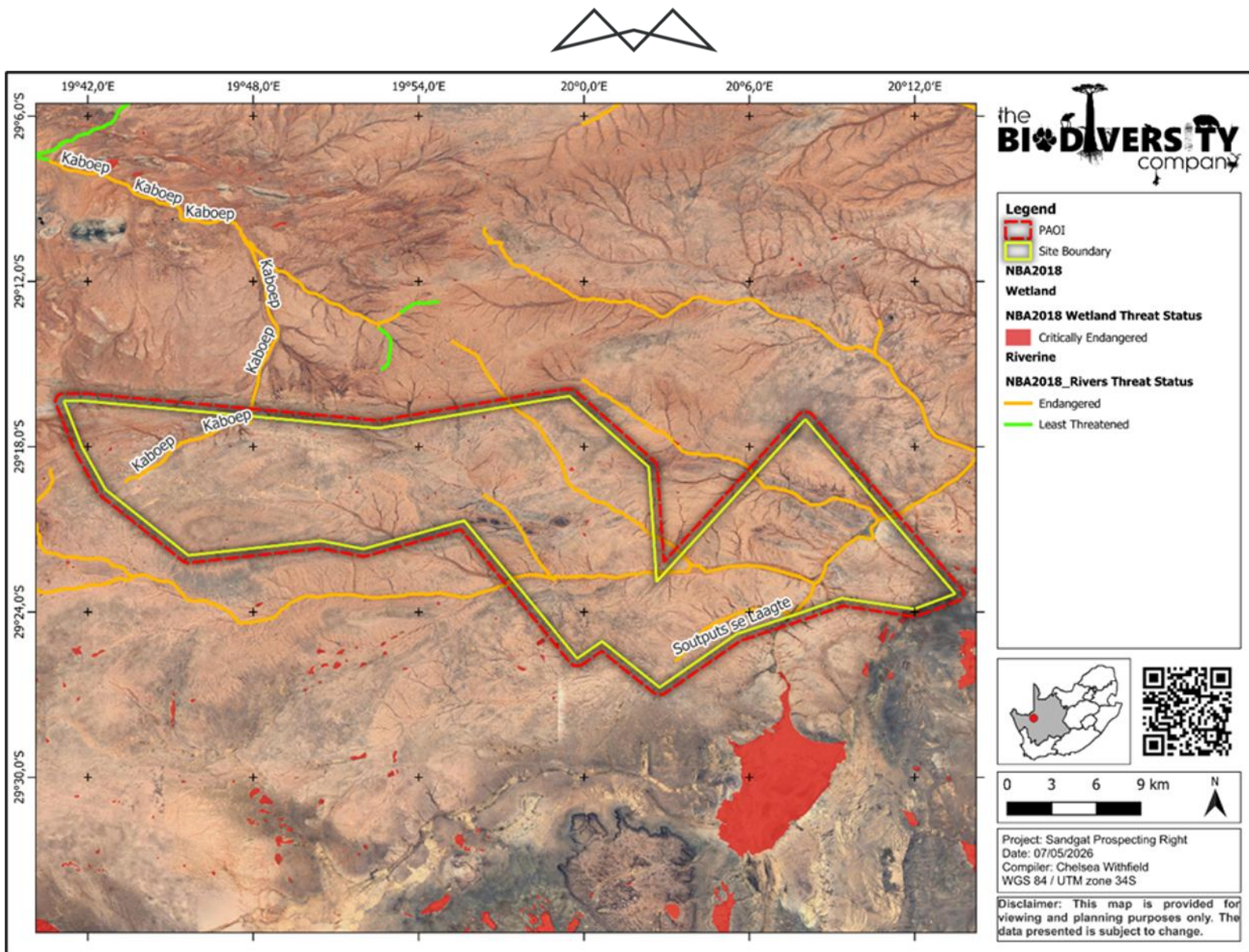


Figure 12: The project area showing the regional ecosystem threat status of the associated aquatic ecosystems (The Biodiversity Company, 2026).



A single high flow survey was conducted from the 14th to the 17th of April 2026. Sampling points were selected for the study to assess the current state of the associated watercourses and identify potential risks that may result from the project. Only watercourses at an appreciable level of risk in relation to the proposed project and related activities were considered for assessment.

The following watercourses were identified within the PAOI during the field survey:

- a) NFEPA Rivers:
  - a. Kaboep River, Soutputs se Laagte River, Steenkampsvlei se Holte River, SVH Tributary, SL Tributary
- b) Wetlands:
  - a. Temporary depression wetlands
- c) Non-perennial/ephemeral watercourses:
  - a. Drainage areas
  - b. NFEPA River tributaries
- d) In-stream dams

The watercourses were delineated according to DWAF (2005), 5 m contour data, the SAIIE dataset (NBA National Wetland Map, 2018), and the latest Google Earth aerial imagery (2024) as well as a site visit and are presented in Figure 13 along with the required buffer areas. According to the buffer guidelines, the maximum required buffer should be applied to a system (Macfarlane, *et al.*, 2014). Riparian areas have high conservation value and can be considered the most important part of a watershed for a wide range of values and resources. They provide important habitat for a large volume of wildlife and often forage for domestic animals. The vegetation they contain is an important part of the water balance for the hydrological cycle through evapotranspiration. They are crucial for riverbank stability and in preventing erosion within the channel (Elmore and Beschta, 1987). The implementation of a buffer zone ensures the ecological requirements needed to maintain both the ecosystem functioning and services offered by the watercourses are maintained. Additionally, the watercourses potentially influenced by the project have sensitivity to further disturbance, requiring protection from the project activities. Therefore, they are considered as high priority areas and should be avoided at all costs.

A conservative buffer zone of **30 m** for all the NFEPA rivers, in-stream dams and temporary depression wetlands, and a **22 m** conservative buffer for the drainage areas were assigned according to the buffer guidelines, the maximum required buffer should be applied to a system (Macfarlane, *et al.*, 2014). These **post-mitigation** buffers considered the projects description (to avoid all sensitive areas), localised and minimal impacts of prospecting, ephemeral nature these systems. These buffer areas (except drainage areas and 22m buffer) serve as **No-go** zones for any unauthorised activities. Refer to Figure 13. The site development plan should therefore be created accordingly. Ensuring buffers are intact increases the resilience of a watercourse to future disturbances. **It should be noted that these conservation buffers only apply to the prospecting activities, not Mining activities.**

In accordance with General Notice (GN) 4167 of 2023 as it relates to the NWA (1998), a regulated area of a watercourse for Section 21 (c) and 21 (i) of the NWA, 1998 means the outer edge of the 1 in 100 year flood or where no flood line has been determined it means 100 m from the edge of a watercourse or a 500 m radius from the delineated boundary (extent) of any wetland or pan. Listed activities in terms of the NEMA (1998), (Act 107 of 1998) EIA Regulations as amended, must be taken into consideration if any infrastructure is to be placed within the applicable zone of regulation, which in this case is a 32 m zone of regulation (ZoR). The PAOI includes five NFEPA rivers, In-stream dams, drainage areas and several temporary depression wetlands and therefore the project falls within the NEMA Act 107 and DWS GN 4167 regulated zones. The regulated areas have been applied to the delineations within the PAOI and are presented in Figure 14.

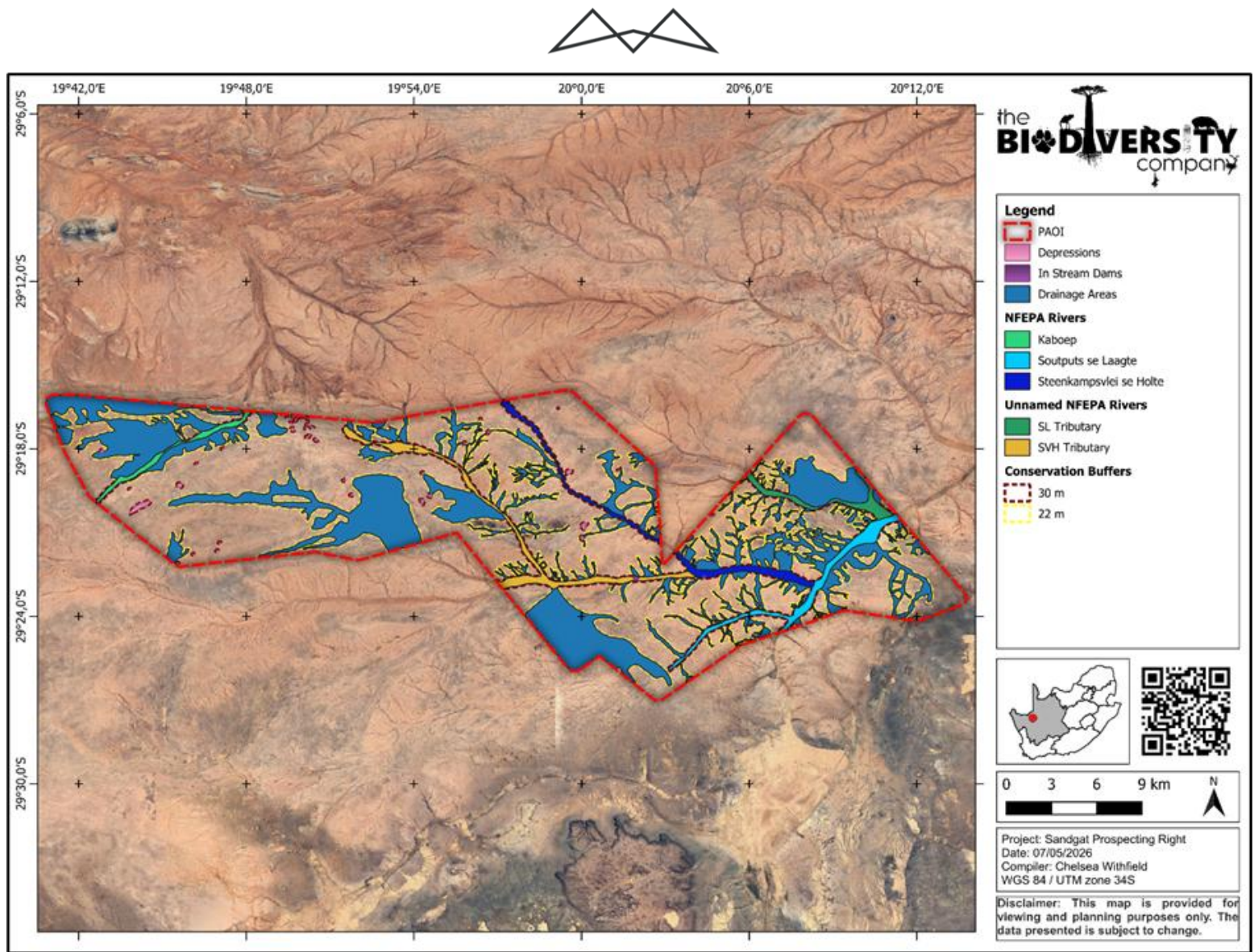


Figure 13: Delineations and buffer areas within the PAOI

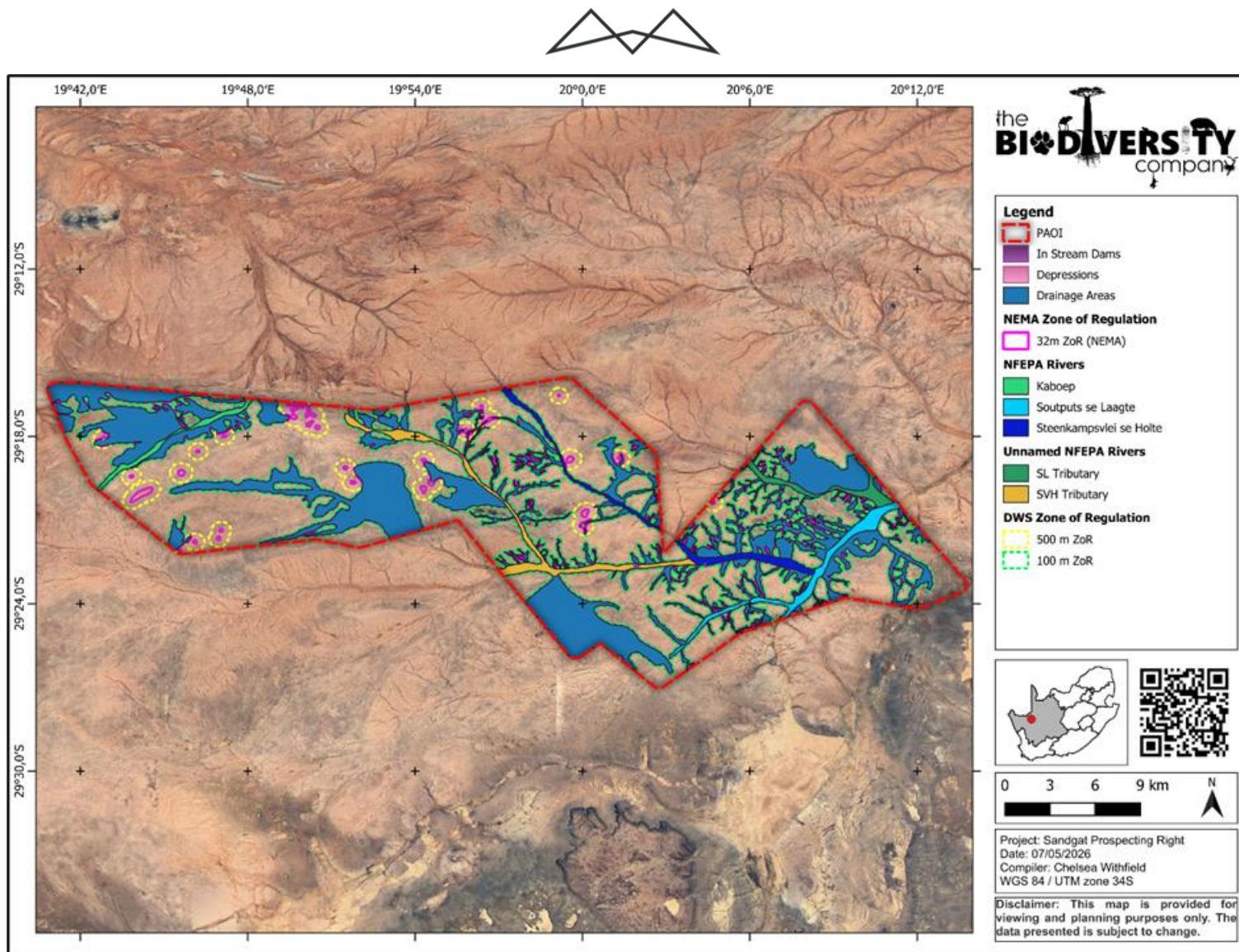


Figure 14: Riparian areas and Zones of Regulation (ZoR) within the PAOI (The Biodiversity Company, 202)



#### 3.1.2.5 TOPOGRAPHY

Figure 15 depicts an overview of the topography of the site and surrounding areas. Topographically, elevations across the study area range from approximately 705 to 1 129 metres above mean sea level (mamsl), with higher elevations located to the west and lower-lying areas to the north-west and south-east. The study area is situated along a local topographic divide, with surface runoff and near-surface runoff expected to move toward the northern and eastern portions of the study area, in line with the prevailing gradient.





### 3.1.2.6 LANDSCAPE QUALITY AND VISUAL

The site consists of a mixture of homesteads with livestock, farming community, low laying grassland, isolated shrubs, bare ground, non-perennial watercourses, rocky outcrops and gravel access roads. Several homesteads and a small farming community were noted on site. Farming activities noted on site largely limited to goat and sheep largely due to the climatic conditions and lack of grass-cover of other livestock farming.

### 3.1.2.7 TERRESTRIAL BIODIVERSITY

The Northern Cape Biodiversity Spatial Plan (NCBSP) (2024), developed by the Northern Cape Department of Environment and Nature Conservation (DENC) in collaboration with SANBI, provides the latest spatial framework for biodiversity conservation in the province. This plan updates and replaces the 2016 Northern Cape CBA Map, aiming to guide sustainable land use and inform environmental decision-making in line with national biodiversity legislation. The BSP defines the following categories: Protected Areas, Critical Biodiversity Areas (CBA), subdivided into CBA 1 and CBA 2, and Ecological Support Areas (ESA). According to the Northern Cape BSP, the PAOI overlaps with CBA 1 and CBA 2. The reasons include vegetation type target, threatened bird's habitat, threatened rivers, wetland river target, and other rivers target.

A new set of Key Biodiversity Areas (KBA) specific to South Africa has been identified using the Global Standard for the Identification of Key Biodiversity Areas version 1.2 (IUCN 2016), applied to South African species and ecosystems. The PAOI is located within 5 km of the Aggenys-Pella-Pofadder KBA.

According to the Mining and Biodiversity Guidelines spatial dataset (2013), the PAOI overlaps with areas of Moderate and Highest Biodiversity Importance (BI) and there is, therefore, a correlating moderate and highest risk for mining, respectively, as per the Mining and Biodiversity Guidelines categories.

The Project Area is situated within the Nama Karoo and Succulent Karoo biomes. The Bushmanland Arid Grassland vegetation type and Bushmanland Basin Shrubland occur within the Nama Karoo biome and the Bushmanland Inselberg Shrubland vegetation type occurs within the Succulent Karoo biomes.

#### 3.1.2.7.1 FLORA

The vegetation assessment was conducted throughout the extent of the PAOI. A total of 83 indigenous plant species were recorded in the PAOI during the field assessment and potential other plant species with a likelihood of occurring have been listed in the BAR. In terms of Protected Species and Species of Conservation Concern (SCC), three (3) flora SCC were observed of which one (1) is Sensitive Species 545. Two (2) of the flora SCC species (*Anacampseros quinaria* and Sensitive Species 545) were found within the Quartz Outcrops habitat type and were relatively abundant. Some scattered *Aloidendron dichotomum* individuals were observed within the Arid Grassland, Arid Grassland Shrubland Mosaic and Quartz Outcrops habitat types. More individuals are expected within the PAOI. In addition to this, twenty-two (22) provincially protected flora species were recorded. It is likely that more provincially protected species occur within the PAOI. *Hoodia gordonii* was also observed within the PAOI and is Nationally Protected according to the NEMBA (Act 10 of 2004) critically endangered species list (Government Notice R151 in Government Gazette 29657 of 23 February 2007). Eleven (11) AIP species were recorded within the PAOI. Two (2) species are considered as Category 3 in the Northern Cape according to NEMBA Table 18. Two (2) species are considered as Category 1b according to NEMBA (Table 18) and must be controlled by implementing an AIP Management Programme, in compliance of section 75 of the NEMBA. These AIP species were mostly concentrated around the modified areas, with *Neltuma spp.* being common along water resources.

#### 3.1.2.7.2 FAUNA

The GBIF database lists eight (8) mammal species that are expected to occur within the PAOI (Expected Mammal Species). None of these are SCC and none are listed by the Screening Tool. Ten (10) mammal species were recorded from the PAOI. Extensive sampling would be required to yield a higher number of observations; however, common mammal species are expected for the area. Five (5) of these species are protected provincially.



The GBIF database lists no amphibian species and thirteen (13) reptile species as likely to occur within the PAOI. One (1) reptile SCC is expected (Table 20). The Screening Tool does not list any herpetofauna. Six (6) reptile species were observed of which the Northern Tent Tortoise (*Psammobates tentorius verroxii*) is considered SCC.

One (1) amphibian species was recorded within the PAOI. The Giant Bullfrog (*Pyxicephalus adspersus*) was observed within a depression wetland within the PAOI and is Nationally Protected according to the NEMBA (Act 10 of 2004) critically endangered species list (Government Notice R151 in Government Gazette 29657 of 23 February 2007). Extensive sampling would be required to yield a higher number of observations; however, more common reptile and amphibian species are expected for the PAOI.

The SABAP2 database lists 74 avifauna species that could be expected to occur within the area (Appendix D of the Specialist Report attached to the BAR). Nine (9) additional SCC have been observed close to or within the PAOI and the Secretarybird (*Sagittarius serpentarius*) was listed in the Screening Tool, totalling to 84 species. Of these, 18 SCC are expected for the PAOI. Seven (7) avifauna SCC were recorded within or close to the PAOI during this assessment. Due to suitable habitat and existing occurrence data, many SCC are expected. Access was also restricted at certain points bordering the PAOI. Therefore, an avifauna walkdown by an appropriately qualified avifauna specialist is recommended prior to commencement of development activities. Avifauna species were recorded from the PAOI. Certain risk species are species that would be affected by disturbance and habitat loss.

Trophic guilds are defined as a group of species that exploit the same class of environmental resources in a similar way (González-Salazar et al, 2014). The guild classification used in this assessment is as per González-Salazar et al (2014); they divided avifauna into major groups based on their diet, habitat, and main area of activity. Although species tend to exhibit varied diets, with invertivores consuming fruit and frugivores consuming insects, for example, the dominant composition of the diet was considered. The analysis of the major avifaunal guilds reveals that the species composition during the survey was dominated by Invertivore Ground Diurnal (IGD) birds, followed by Granivore Ground Diurnal (GGD), Carnivore Ground Diurnal (CGD) and Omnivore Ground Diurnal (OGD). Three nests were recorded, that of three Pied Crows. None of these species is SCCs; however, based on the high number of SCC recorded and known to occur in the area, a nest walkdown would be required before site clearance. Flight paths were recorded, but due to the nature of this project and no specific flight path corridors being noted during the field survey, the impact is low.

#### 3.1.2.7.3 HABITATS

Six (6) major terrestrial habitats, and a set of Water Resources (three habitats, as defined by the Freshwater Specialist), were identified across the PAOI. The majority of the PAOI consists of Arid Grassland Shrubland Mosaic habitat type. The condition of this habitat varied across the PAOI due to different levels of grazing impacts, possible rotation grazing as well as possible differences in rain received across the PAOI. Other terrestrial habitats identified include Arid Grassland, Rocky Arid Grassland Shrubland Mosaic, Quartz Outcrops, Rocky Outcrops and Modified. Arid Grassland.

The habitat units for the PAOI can be seen delineated in Figure 16. Site Ecological Importance of the PAOI for terrestrial is included in Figure 17. Avoidance mitigation is required for the areas of Very High sensitivity in Figure 17. The black areas in this map should be avoided by the planned prospecting activities.

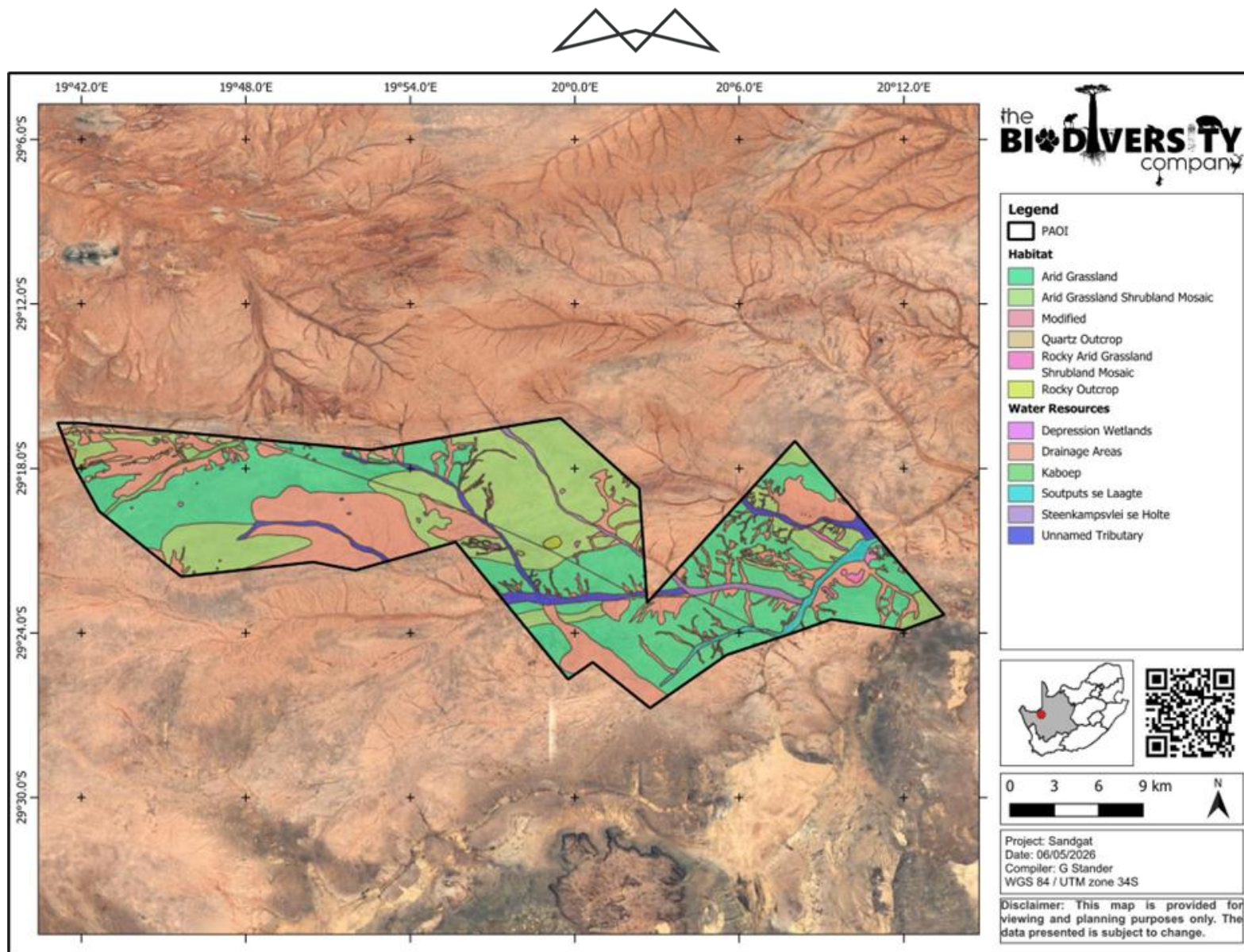


Figure 16: Habitat types (The Biodiversity Company, 2026)

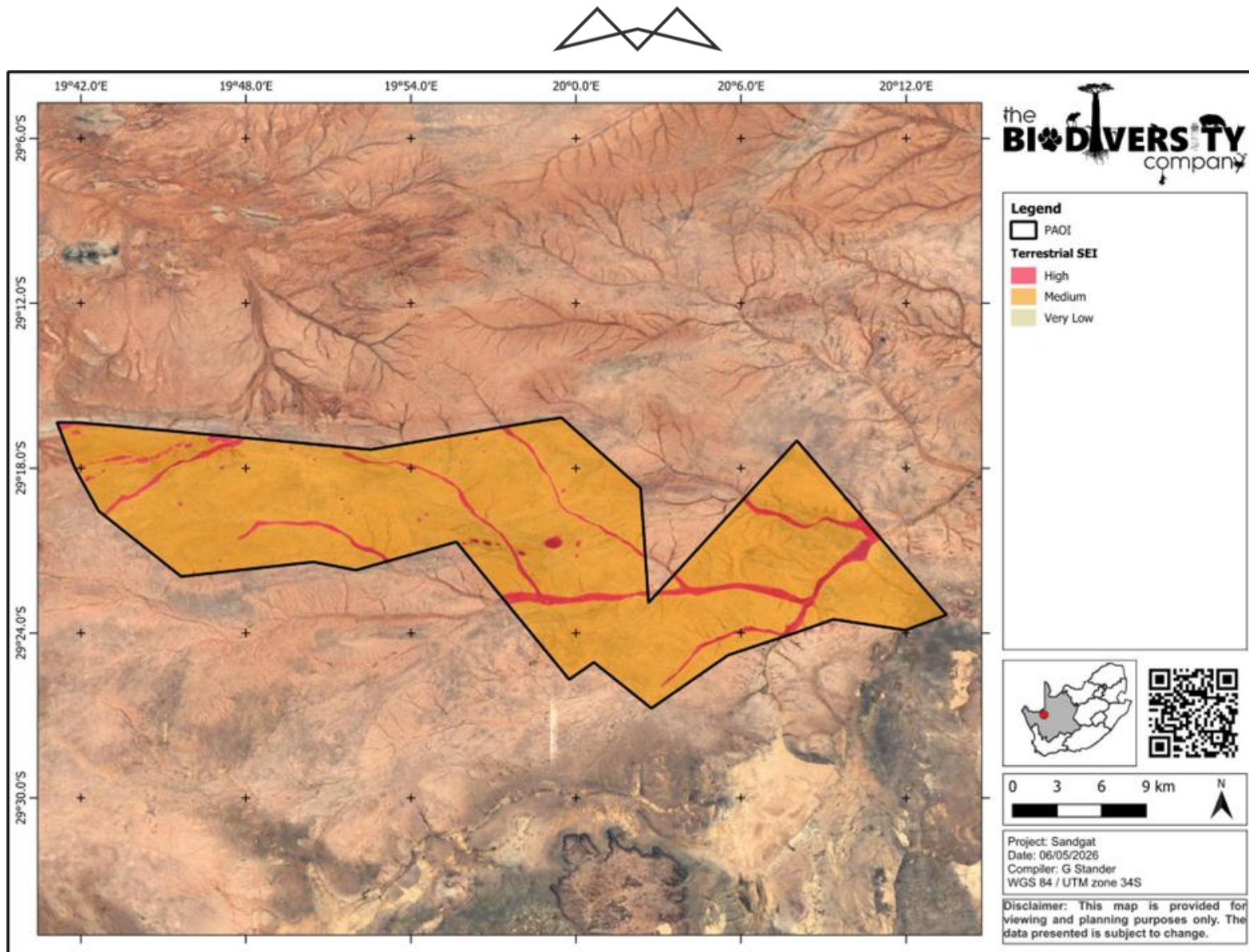


Figure 17: Site Ecological Importance of the PAOI for terrestrial (The Biodiversity Company, 2026).



All habitats within the PAOI were assigned a sensitivity category, i.e., a Site Ecological Importance (SEI) category. The PAOI was categorised as possessing habitats with areas ranging from Very Low to High SEI. It is important to note these sensitivities are based solely on prospecting and does not reflect the sensitivities of mining.

### 3.1.2.8 SOCIO-ECONOMIC ENVIRONMENT

Land use is predominantly grazing and open natural veld, with large farm portions forming the primary spatial units. These farms support low-intensity livestock grazing, mainly sheep and goats, due to the limited carrying capacity of the land. Overall, land use remains largely rural and agricultural.

The Northern Cape has a small population of 1 355 629 people while being the largest province of South Africa. Afrikaans is the most spoken language in the province, followed by Setswana and isiXhosa. The province's population has slightly increased between 2011 and 2022. Approximately 66% of the population is of working age, i.e. between 15 and 64 years old, with 28% of the population being young children, and 6% being the elderly.

Considering available data, the main economic activity of the Northern Cape is mining, followed by agriculture. Agricultural activities of the province relate to irrigation-based agriculture linked to the Orange River in the north. The economic structure of the Namaqua District Municipality underpinning jobs is mining-led, with Mining contributing 39.8% to the district's total industry output. The agricultural sector employs the most people in the ZF Mgcawu District Municipality followed closely by Community Services and Trade Sectors. While mining generates the highest Gross Domestic Product (GDP) value for the eastern parts of the district (like Postmasburg and Lime Acres), it is highly mechanized and employs a smaller overall percentage of the total workforce compared to agriculture and services.

Employment within the Namaqua District is concentrated in Nama Khoi (42.25%) and Khâi-Ma (28.69%). As of 2022, the unemployment rate of the District Municipality was 28%.

Employment in the ZF Mgcawu District (Northern Cape) is heavily concentrated in the Dawid Kruiper and Kai !Garib local municipalities. This concentration is primarily driven by Upington (the district's administrative, financial, and commercial hub), thriving agricultural sectors along the Orange River, and extensive mining and renewable energy operations. Dawid Kruiper, which includes towns Upington (the district capital), Keimoes, and Rietfontein dominates the district in terms of population and job opportunities. Employment is heavily concentrated in wholesale and retail trade, government and administrative services, financial services, tourism, and intensive agriculture (table grapes and raisins along the Orange River). Kai !Garib Local Municipality centres of employment include Kakamas, Kenhardt, and Brandboom, and is the largest agricultural employer in the district. Jobs are concentrated in agriculture (viticulture, fruit production, and horticulture) and massive renewable energy projects (solar farms near Kenhardt and Kakamas). As of 2022, the unemployment rate of the District Municipality was 26.8 %.

Public services in the surrounding area are limited due to its rural nature and low population density. Basic infrastructure such as water supply and sanitation is primarily managed at the farm level, with boreholes and windmills supporting livestock farming.

Education statistics were accessible through census data of 2022 (StatsSA, 2022) relating to the two Local Municipalities intersected, i.e., Kai !Garib, and Khâi-Ma Local Municipalities. These data are presented as such.

Education in Khâi-Ma reflects similar trends to other rural areas in the Northern Cape. Among youth aged 5-24, approximately 61% attend an educational institution, while about 39% do not, indicating notable challenges with school access and retention. For adults (20+ years), the largest proportion, 48,4% has some secondary education but did not complete matric. 30,6% have matric (Grade 12), and only 4,6% achieved higher education. Smaller segments have only primary schooling (9%) or no schooling at all (0,6%).

Education in Kai !Garib reflects similar trends to other rural areas in the Northern Cape. Among youth aged 5-24, approximately 65.7% attend an educational institution, while about 34.3% do not, indicating notable challenges with school access and retention. For adults (20+ years), the largest proportion, 49% has some secondary education but did not complete matric. Only 23,8% have matric (Grade 12), and only 3,5% achieved higher education. Smaller segments have only primary schooling (7%) or no schooling at all (4,4%).



Overall, this suggests that while basic education access is relatively strong, dropout rates during secondary school remain high, matric completion is moderate, and tertiary education attainment is very low. These patterns highlight the need for interventions to improve secondary school retention, matric pass rates, and access to post-school training and higher education opportunities.

Namaqua District's health profile is shaped by its demographic trends and rural context. The population pyramid indicates a shrinking elderly population and a growing younger population, which has implications for healthcare planning. While the IDP does not provide detailed facility counts in the excerpt, it emphasises the need for age-specific health services, including senior care and maternal/child health programs. The district faces challenges typical of remote areas, such as limited access to specialized healthcare, reliance on small clinics, and the need for improved social services. Future planning must consider resource allocation for both aging residents and young families, ensuring adequate healthcare infrastructure and preventive programs.

The ZF Mgcawu District's health profile is shaped by its demographic trends, vast geographic layout, and rural context (CoGTA, 2020). The district's population pyramid highlights a prominent working-age cohort alongside a large youth population, which creates significant long-term implications for healthcare infrastructure and workforce planning (National Treasury, 2021). To service the population, the district relies on a network of roughly 52 primary healthcare facilities, including two district hospitals and one regional hospital in Upington, but rural areas and agricultural settlements along the Orange River face severe geographic barriers to care (CoGTA, 2020). Consequently, local integrated planning emphasizes the urgent need for age-specific health services, including maternal and child health programs, robust HIV and Tuberculosis interventions, and chronic disease management for non-communicable illnesses (ZF Mgcawu District Municipality, 2022). Future strategic planning must focus on equitable resource allocation, expanding mobile clinic outreach to remote farming communities, and recruiting specialized medical personnel to ensure sustainable healthcare infrastructure and adequate preventive health programs across all municipalities (ZF Mgcawu District Municipality, 2022).

### 3.1.2.9 CULTURAL HERITAGE

The Northern Cape is associated with a long archaeological record that spans across pre-colonial and colonial periods. Most notable is the region's significant role in terms of Hunter-gatherer activity. The closest town to the site in question is Pofadder, which itself embodies rich heritage in relation to the colonial history and modern economic development of South Africa. Stone Age artefacts or finds and sites form a key component of the archaeological record of the Northern Cape. This is related to the extensive hunter-gatherer activity in the area. The Northern Cape Stone Age is defined by its lithic collection which includes examples of Early Stone Age (ESA), Middle Stone Age (MSA), and Late Stone Age (LSA).

Altogether, eight (8) (apart from the noted farm dams or reservoirs) structures, buildings, or complexes as well as two grave sites were identified as having or potentially having heritage significance. The Lovedale grave site includes graves dating back to 1920. Therefore, the graves in question are protected by the NHRA, and have been provisionally graded as Grade III A or of High significance, corresponding with previous ratings as per previous studies. Similarly, the Lovedale farm complex has been graded as Grade III A given its connection with the grave site. Corresponding with this grading, the Bossiekom farm complex and associated grave site has similarly been provisionally graded as Grade III A. This suggests that the site must be retained as a heritage register site. In essence, this site must be avoided during the proposed activities. All other farm complexes have been provisionally graded as Grade IV A or of Medium significance. This suggests that mitigation must take place should proposed activities have the potential to disturb these features. Figure 18 presents a visual summary of the main findings and their locations. Table 8 provides a summary of the different features identified, a description of the feature, as well as the coordinates of a relative central point associated with the find. Note that this list does not include the many farm dams and associated infrastructure.



Table 8: Summary of different finds identified.

Feature No.	Description	Ratings and Significance	Coordinate
<b>SG001</b>	Farm Complex – Lovedale. Farm complex may include structures dating 60 years or older.	Grade III A High	29°16'38.01"S, 19°42'21.45"E
<b>SG002</b>	Grave site – Associated with the Lovedale farm complex.	Grade III A High	29°16'48.51"S, 19°42'28.52"E
<b>SG003</b>	Farm Complex – Nuwedam. Farm complex may include structures dating 60 years or older.	Grade IV A Medium	29°16'47.61"S, 19°47'41.00"E
<b>SG004</b>	Farm Complex – Quaggamaag. Farm complex may include structures dating 60 years or older.	Grade IV A Medium	29°16'53.61"S, 19°47'32.71"E
<b>SG005</b>	Farm Complex – Hartebeesvlei. Farm complex may include structures dating 60 years or older.	Grade IV A Medium	29°18'50.49"S, 19°54'9.39"E
<b>SG006</b>	Farm Complex – Soutputs. Farm complex may include structures dating 60 years or older.	Grade IV A Medium	29°22'21.81"S, 20°9'2.13"E
<b>SG007</b>	Grave site – Associated with the Bossiekom farm complex.	Grade III A High	29°24'12.57"S, 20°6'25.62"E
<b>SG008</b>	Farm Complex – Bossiekom. Farm complex may include structures dating 60 years or older.	Grade III A High	29°24'8.36"S, 20°6'34.03"E
<b>SG009</b>	Farm Complex – Vaalkop. Farm complex may include structures dating 60 years or older.	Grade IV A Medium	29°22'43.11"S, 20°2'9.39"E
<b>SG010</b>	Farm Complex – Kraandraai. Farm complex may include structures dating 60 years or older.	Grade IV A Medium	29°22'40.23"S, 20°4'23.38"E

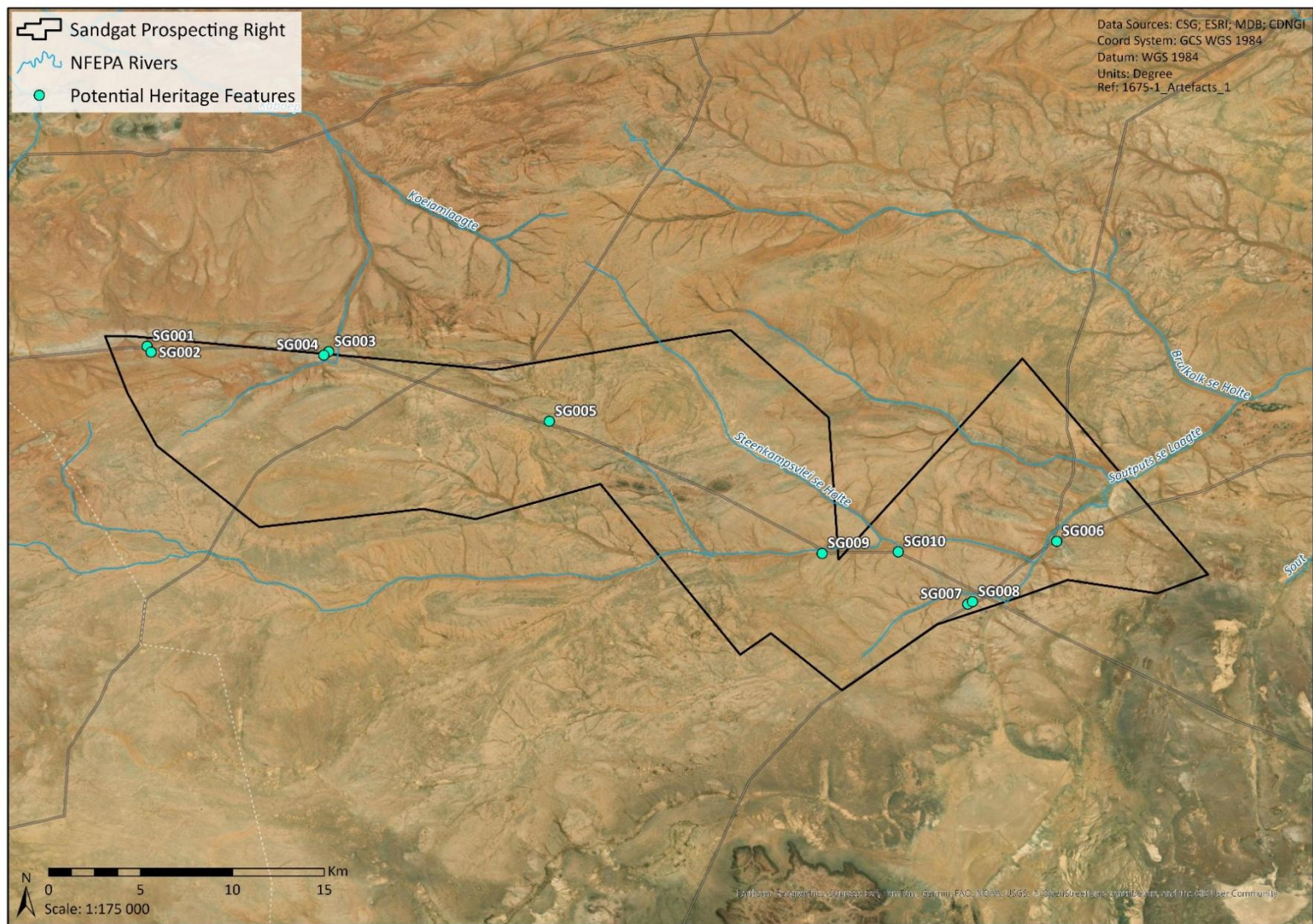


Figure 18: Map of potential heritage features across the PR area.



### 3.1.2.10 PALAEOLOGY

The study area is underlain by the potentially fossiliferous Late Cenozoic surface layers of the Kalahari Group, as well as the Dwyka Group (Karoo Supergroup). At depth, the area is underlain by a diversity of unfossiliferous Precambrian basement rocks (c. 2 billion years old) of the Namaqua-Natal Province. The PalaeoMap on the South African Heritage Resources Information System (SAHRIS) database indicates that the Palaeontological Sensitivity of the study area is Moderate, Low and Zero (Almond et al, 2013; SAHRIS website) (Figure 19: Extract of the SAHRIS PalaeoMap map (Council of Geosciences) indicates that the development is underlain by sediments with a Moderate (green), Low (blue) and Zero (grey) Palaeontological Sensitivity.(Benzai, 2026) while the National Environmental Web-based Screening Tool indicates that the development has a Medium, Low and Unknown Palaeontological Sensitivity (Figure 20).

The fossil assemblages of the Kalahari Group are generally very low in diversity and occur over a wide range, the Dwyka Group has a Moderate Palaeontological Sensitivity while the Namaqua-Natal Province is unfossiliferous and thus have a Zero Palaeontological Sensitivity. It is therefore recommended that no further palaeontological heritage studies, ground truthing and/or specialist mitigation are required pending the discovery of newly discovered fossils.

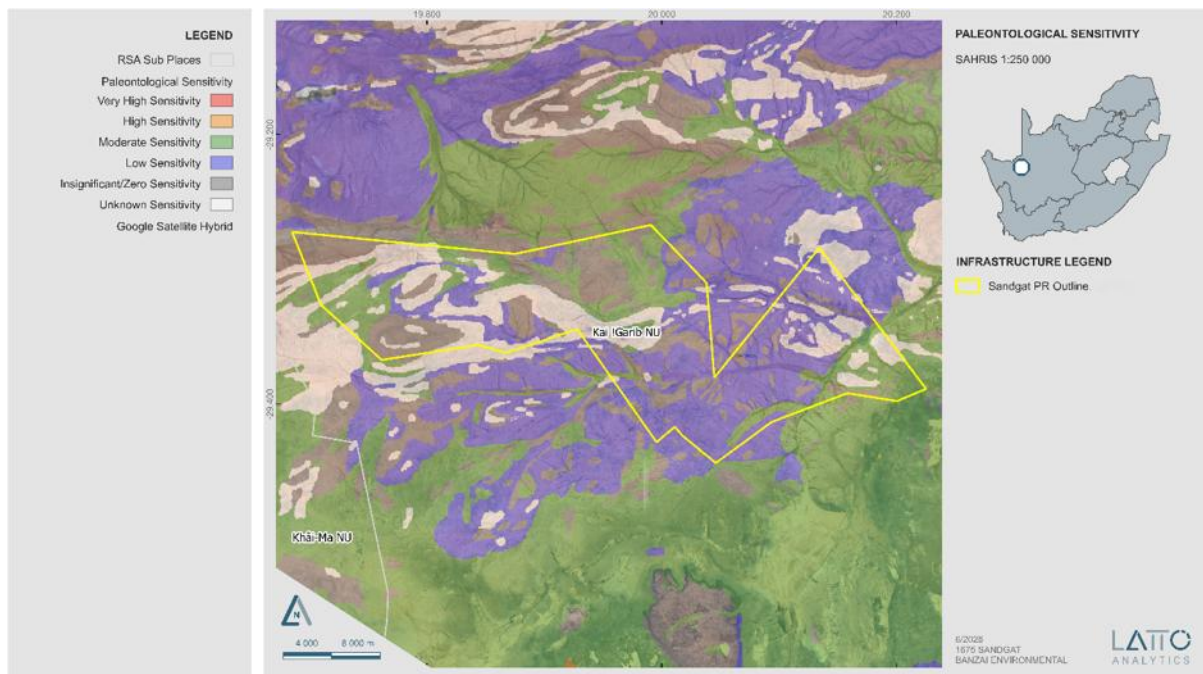
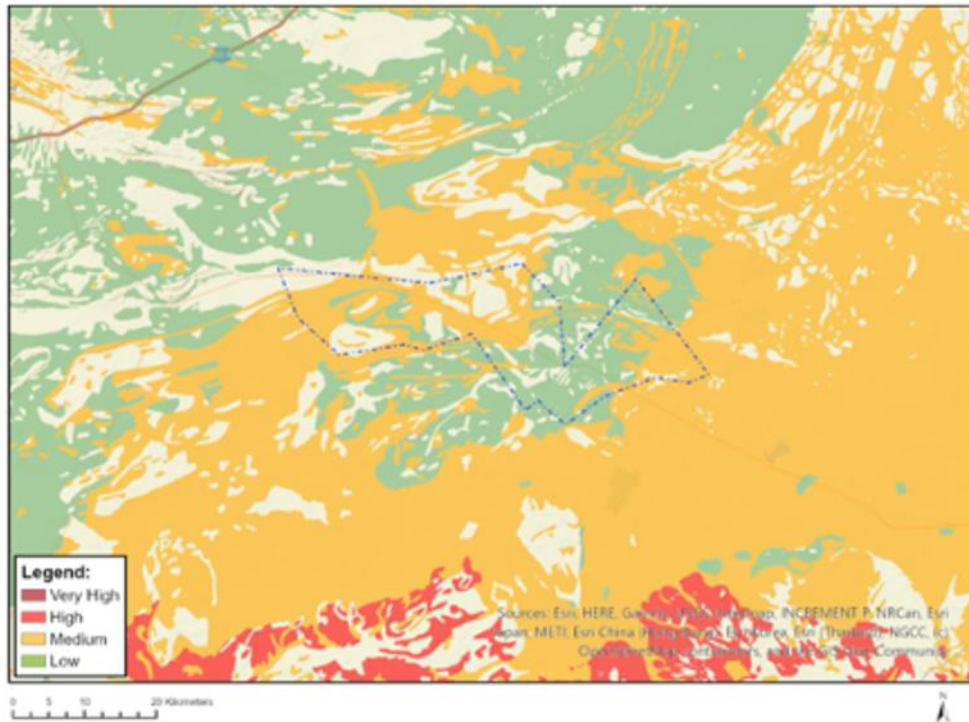


Figure 19: Extract of the SAHRIS PalaeoMap map (Council of Geosciences) indicates that the development is underlain by sediments with a Moderate (green), Low (blue) and Zero (grey) Palaeontological Sensitivity.(Benzai, 2026).



MAP OF RELATIVE PALEONTOLOGY THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
		X	

Sensitivity Features:

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

Figure 20: Palaeontological Sensitivity of the study site by the National Environmental Web-based Screening Tool indicates a Medium (yellow), Low (green) and Unknown (white) Palaeontological Sensitivity.



### 3.1.3 STAKEHOLDER ISSUES AND COMMENTS

A public participation process as required by the NEMA 2014 EIA regulations will be undertaken for the proposed prospecting activities. In this regard please refer to Section 6 and Appendix D of the BAR for a comprehensive record of the process followed and comments received. Once all comments have been received, an extract from the Comments and Responses Report (CRR) which relate to final rehabilitation, decommissioning and closure activities will be provided in this section. The comments and issues raised through the public participation will be considered and inform the final compilation of this FRDCP.

## 3.2 ENVIRONMENTAL RISK ASSESSMENT

Section 8 of the BAR provides a detailed description of the environmental impact/risk identification and assessment (including the methodology and findings) undertaken for the proposed prospecting activity. The broad approach to the significance rating methodology is to determine the significance (S) of an environmental risk or impact by considering the consequence (C) of each impact (comprising Nature, Extent, Duration, Magnitude, and Reversibility) and relating this to the probability/ likelihood (P) of the impact occurring. The S is determined for the pre- and post-mitigation scenario. In addition, other factors, including cumulative impacts and potential for irreplaceable loss of resources, are used to determine a prioritisation factor (PF) which is applied to the S to determine the overall final significance rating (FS).

Table 9 lists the environmental impacts and risks identified and assessed in the EIA/ Basic Assessment, which relate to final rehabilitation, decommissioning and closure of the prospecting activity. The EMPr addresses the management and mitigation of environmental impacts associated with the preceding phases whilst the annual environmental rehabilitation plan (to be prepared and reviewed annually) will provide for the planning and financial provisioning for the concurrent and progressive rehabilitation and remediation activities.

The applicable conceptual closure strategy to avoid, manage and mitigate the impacts and risks are also included in Table 9 together with the re-assessment of the environmental risk. The environmental risk assessment of the impacts associated with final rehabilitation, decommissioning and closure will inform the most appropriate closure strategy for the prospecting activity. It is expected that, in most cases, if all the management and mitigation measures identified in the Basic Assessment and EMPr are adhered to and successfully implemented, then no latent or residual environmental impacts will remain. Impacts that are classified as high risk post-mitigation will be considered as latent environmental impacts and financial provision will be provided to remediate these specific impacts. Please see Section 5 for further details.



Table 9: Environmental impacts and risks.

Activity	Environmental Aspect	Impact Description	Phase	Pre-mitigation	Detailed Mitigation Measures	Post-mitigation
<b>Undertake closure and rehabilitation</b>	Geology & Soils	Loss of land capability	Decommissioning	Low (-)	Mitigation as per rehab plan, topsoil management, erosion control, decompaction, removal of materials	Low (-)
	Geology & Soils	Loss of land capability	Rehabilitation & Closure	Low (-)	Topsoil replacement, erosion control, revegetation, monitoring	Low (-)
	Geology & Soils	Loss of grazing potential	Decommissioning	Low (-)	Rehabilitation and vegetation restoration	Low (-)
	Geology & Soils	Loss of grazing potential	Rehabilitation & Closure	Low (-)	Revegetation, invasive species control	Low (-)
<b>Target Prospecting Boreholes &amp; Widely Spaced Boreholes</b>	Groundwater	Soil disturbance and contamination	Decommissioning & Closure	Low (-)	Site clean-up, removal of waste, rehabilitation	Low (-)
	Groundwater	Groundwater contamination	Decommissioning & Closure	Low (-)	Seal boreholes, prevent aquifer contamination	Low (-)
<b>Temporary Fuel Storage</b>	Groundwater	Hydrocarbon spillages	Decommissioning & Closure	Low (-)	Spill control, bunding, contaminated soil removal	Low (-)
<b>Target Prospecting Boreholes &amp; Widely Spaced Boreholes</b>	Groundwater	Improper handling of drilling fluids	Decommissioning & Closure	Low (-)	Dispose of drilling waste, clean sites	Low (-)
	Aquatic	Impeding hydro-dynamics	Decommissioning	Medium–High (-)	Restore drainage, revegetate, stormwater controls	Low (-)



Activity	Environmental Aspect	Impact Description	Phase	Pre-mitigation	Detailed Mitigation Measures	Post-mitigation
	Aquatic	Water quality impairment	Decommissioning	Medium–High (-)	Waste management, spill prevention	Low (-)
	Aquatic	Siltation of watercourses	Decommissioning	Medium–High (-)	Sediment control, stabilisation	Low (-)
<b>All Activities</b>	Noise	Noise impacts	Closure	Low (-)	Limit noise, notify landowners, PPE	Low (-)
<b>Undertake closure and rehabilitation</b>	Topography	Alteration of topography	Rehabilitation & Closure	Low (-)	Restore contours, backfill	Low (-)
<b>Site Clearance and establishment</b>	Biodiversity	Vegetation loss and fauna disturbance	Decommissioning	Medium–High (-)	Rehabilitation, revegetation, invasive control, monitoring	Low (-)
<b>Undertake closure and rehabilitation</b>	Social	Social impacts	Decommissioning	Low–Medium (-)	Grievance mechanism, stakeholder engagement	Low (-)

It is important to note that the environmental risk assessment will be revised and updated on an annual basis to ensure that this FRDCP remains applicable to the actual and predicted environmental impacts and risks.



### 3.3 ENVIRONMENTAL INDICATORS AND MONITORING

Table 10 provides a list of the identified environmental impacts identified for the rehabilitation, decommissioning and closure of the prospecting activity. In addition, environmental indicators are identified for each impact, together with proposed monitoring requirements. The indicators and monitoring will aim to inform ongoing rehabilitation and remediation activities. These indicators will also inform the assessment of whether the closure objectives have been adequately met.

Table 10: Environmental Indicators and Monitoring Requirements.

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
<b>Prospecting boreholes: 20 sites , with a footprint of 300 m<sup>2</sup> each.</b>	Construction and Operation  Decommissioning	0.6 ha, short term	<ul style="list-style-type: none"> <li>• Vegetation clearing for prospecting sites should be kept to a minimum in order to reduce the disturbance footprint;</li> <li>• Compaction of soil must be avoided as far as possible, and the use of heavy machinery must be restricted in areas outside of the proposed prospecting sites to reduce the compaction of soils;</li> <li>• All measures should be implemented to minimize the potential of dust generation;</li> <li>• Local residents should be notified of any potentially noisy activities or work and these activities should be undertaken at reasonable times of the day;</li> <li>• Noise attenuation on engines must be adequate, and the noisy activities must be restricted as far as possible to times and locations whereby the potential for noise nuisance is reduced;</li> </ul>	SANS 10103  ECA Noise Regulations  NEMAQA  Dust Regulations  NWA	Throughout Construction and operation and decommissioning



Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
			<ul style="list-style-type: none"> <li>• When working near to a potential sensitive area, the contractor must limit the number of simultaneous activities to the minimum;</li> <li>• Ensure proper storage of fuels;</li> <li>• On-site vehicles must be limited to approved access routes and areas on the site so as to minimize excessive environmental disturbance to the soil and vegetation on site, and to minimize disruption of traffic;</li> <li>• Workforce should be kept within defined boundaries and to agreed access routes;</li> <li>• Adherence to the buffer areas. These should be visibly demarcated on site to avoid encroachment into these areas;</li> <li>• Should any watercourse be affected, then the necessary water use licences should be obtained from the Department of Water and Sanitation;</li> <li>• No ablution of site laydown areas are to be located within buffer areas;</li> <li>• Where shallow aquifers are encountered, a survey of the drinking water/ livestock watering boreholes should be undertaken (within 5km of the prospecting borehole sites). A detailed groundwater monitoring programme should be developed for these drinking water/ livestock watering boreholes and pre- and</li> </ul>		



Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
			<p>post-prospecting water quality samples should be taken;</p> <ul style="list-style-type: none"> <li>Where drinking water/ livestock watering boreholes are to be affected, and where a pollution event occurs at a particular borehole, then the advice of a geohydrologist should be sought with regards to the need for plugging and casing of the prospecting boreholes.</li> </ul>		
<b>Borehole Closure</b>	Decommissioning and Closure	Short term and localized	<ul style="list-style-type: none"> <li>Where groundwater is encountered during drilling, all affected prospecting boreholes that will not be required for later monitoring or other useful purposes should be plugged and sealed with cement to prevent possible cross flow and contamination between aquifers;</li> <li>Cement and liquid concrete are hazardous to the natural environment on account of the very high pH of the material, and the chemicals contained therein. As a result, the contractor shall ensure that:               <ul style="list-style-type: none"> <li>Concrete shall not be mixed directly on the ground;</li> <li>The visible remains of concrete, either solid, or from washings, shall be physically removed immediately and disposed of as waste, (Washing of visible signs into the ground is not acceptable); and</li> <li>All excess aggregate shall also be removed.</li> </ul> </li> </ul>	NWA DWAf BPG	Throughout Decommissioning and Closure



Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
<b>Removal of surface infrastructure</b>	Decommissioning	Short term and localized	<ul style="list-style-type: none"> <li>All infrastructure, equipment, and other items used during prospecting will be removed from the site;</li> <li>Compaction of soil must be avoided as far as possible. The use of heavy machinery must be restricted in areas outside of the proposed prospecting sites to reduce the compaction of soils.</li> </ul>	MPRDA Rehab Plan	Decommissioning
<b>Removal of waste</b>	Decommissioning	Small scale and localized	<ul style="list-style-type: none"> <li>Any excess or waste material or chemicals, including drilling muds etc. must be removed from the site and must preferably be recycled (e.g. oil and other hydrocarbon waste products). Any waste materials or chemicals that cannot be recycled must be disposed of at a suitably licensed waste facility.</li> </ul>	NWA DWAF BPG	Decommissioning
<b>Rehabilitation</b>	Rehabilitation	All disturbed areas	<ul style="list-style-type: none"> <li>Restoration and rehabilitation of disturbed areas must be implemented as soon as prospecting activities are completed;</li> <li>Sites must be restored to the original condition with vegetation cover (where applicable) equalling the surrounding vegetation cover;</li> <li>All debris and contaminated soils must be removed and suitably disposed of;</li> <li>Contours and natural surrounding must be reformed;</li> <li>Natural drainage patterns must be restored;</li> <li>All surface infrastructure on site must be removed;</li> </ul>	MPRDA Rehab Plan NEMA	Rehabilitation



Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
			<ul style="list-style-type: none"> <li>• Temporary access routes/roads must be suitably rehabilitated; and</li> <li>• Sites must be monitored by the ECO (including relevant specialist's inputs if, necessary) for adequate rehabilitation until the desired rehabilitation objectives have been achieved.</li> </ul>		
<b>Monitoring</b>	Post-Operational	All rehabilitated areas	<ul style="list-style-type: none"> <li>• The post-operational monitoring and management period following decommissioning of prospecting activities must be implemented by a suitable qualified independent party for a minimum of one (1) year unless otherwise specified by the competent authority. The monitoring activities during this period will include but not be limited to:               <ul style="list-style-type: none"> <li>○ Biodiversity monitoring; and</li> <li>○ Re-vegetation of disturbed areas where required.</li> </ul> </li> <li>• Provision must be made to monitor any unforeseen impact that may arise as a result of the proposed prospecting activities and incorporated into post closure monitoring and management.</li> </ul>	MPRDA Rehab Plan	Post-operation



## 3.4 DESIGN PRINCIPLES

### 3.4.1 LEGISLATIVE AND GOVERNANCE FRAMEWORK

The requirement for final rehabilitation, decommissioning and closure stems primarily from the legislative requirements of the MPRDA and the NEMA. The relevant extracts from each of these are presented in this section. Please also refer to the EIA Reports (2017 and 2024) for an overview of other enviro-legal requirements which may influence closure planning.

### 3.4.2 MINERALS AND PETROLEUM RESOURCES DEVELOPMENT ACT, ACT 28 OF 2002

The following extracts relate to the principle of closure for any right issued under the MPRDA:

- Section 43(1): The holder of a prospecting right, mining right, retention permit, mining permit, or previous holder of an old order right or previous owner of works that has ceased to exist, remains responsible for any environmental liability, pollution, ecological degradation, the pumping and treatment of extraneous water, compliance to the conditions of the environmental authorisation and the management and sustainable closure thereof, until the Minister has issued a closure certificate in terms of this Act to the holder or owner concerned.
- Section 43(4): An application for a closure certificate must be made to the Regional Manager in whose region the land in question is situated within 180 days of the occurrence of the lapsing, abandonment, cancellation, cessation, relinquishment or completion contemplated in subsection (3) and must be accompanied by the required information, programmes, plans and reports prescribed in terms of this Act and the National Environmental Management Act, 1998.
- Section 43 (5): No closure certificate may be issued unless the Chief Inspector and each government department charged with the administration of any law which relates to any matter affecting the environment have confirmed in writing that the provisions pertaining to health and safety and management pollution to water resources, the pumping and treatment of extraneous water and compliance to the conditions of the environmental authorisation have been addressed.
- Section 43 (7): The holder of a prospecting right, mining right, retention permit, mining permit, or previous holder of an old order right or previous owner of works that has ceased to exist, or the person contemplated in subsection (2), as the case may be, must plan for, manage and implement such procedures and such requirements on mine closure as may be prescribed.
- Section 43 (8): Procedures and requirements on mine closure as it relates to the compliance of the conditions of an environmental authorisation, are prescribed in terms of the National Environmental Management Act, 1998.

The following extracts from the MPRDA Regulations are specifically applicable to the preparation of this FRDCP:

- Regulation 56: Principles for mine closure: In accordance with applicable legislative requirements for mine closure, the holder of a prospecting right, mining right, retention permit or mining permit must ensure that -
  - (a) the closure of a prospecting or mining operation incorporates a process which must start at the commencement of the operation and continue throughout the life of the operation;
  - (b) risks pertaining to environmental impacts must be quantified and managed pro-actively, which includes the gathering of relevant information throughout the life of a prospecting or mining operation;
  - (c) the safety and health requirements in terms of the Mine Health and Safety Act, 1996 (Act No. 29 of 1996) are complied with;
  - (d) residual and possible latent environmental impacts are identified and quantified;



- (e) the land is rehabilitated, as far as is practicable, to its natural state, or to a predetermined and agreed standard or land use which conforms with the concept of sustainable development; and
  - (f) prospecting or mining operations are closed efficiently and cost effectively.
- **Regulation 61:** Closure objectives- Closure objectives form part of the draft environmental management programme or environmental management plan, as the case may be, and must –
    - (a) identify the key objectives for mine closure to guide the project design, development and management of environmental impacts;
    - (b) provide broad future land use objective(s) for the site; and
    - (c) provide proposed closure costs.
  - **Regulation 62:** Contents of closure plan: A closure plan contemplated in section 43(3)(d) of the Act, forms part of the environmental management programme or environmental management plan, as the case may be, and must include -
    - (a) a description of the closure objectives and how these relate to the prospecting or mine operation and its environmental and social setting;
    - (b) a plan contemplated in regulation 2(2), showing the land or area under closure;
    - (c) a summary of the regulatory requirements and conditions for closure negotiated and documented in the environmental management programme or environmental management plan, as the case may be;
    - (d) a summary of the results of the environmental risk report and details of identified residual and latent impacts;
    - (e) a summary of the results of progressive rehabilitation undertaken;
    - (f) a description of the methods to decommission each prospecting or mining component and the mitigation or management strategy proposed to avoid, minimize and manage residual or latent impacts;
    - (g) details of any long-term management and maintenance expected;
    - (h) details of a proposed closure cost and financial provision for monitoring, maintenance and post closure management;
    - (i) a sketch plan drawn on an appropriate scale describing the final and future land use proposal and arrangements for the site;
    - (j) a record of interested and affected persons consulted; and technical appendices, if any.

### 3.4.3 NATIONAL ENVIRONMENTAL MANAGEMENT ACT (ACT 107 OF 1998)

Prior to 8<sup>th</sup> December 2014, the environmental aspects of prospecting activities were regulated in terms of the MPRDA. Recent legislative amendments and the drive towards a 'one environmental system' have resulted in the inclusion of the requirement for rehabilitation, decommissioning and closure planning and associated financial provisions into the NEMA. Specific sections of the act are extracted below:

- **Section 24P:** Financial provision for remediation of environmental damage:
  - (1) An applicant for an environmental authorisation relating to prospecting, exploration, mining or production must, before the Minister responsible for mineral resources issues the environmental authorisation, comply with the prescribed financial provision for the rehabilitation, closure and ongoing post decommissioning management of negative environmental impacts.



- (2) If any holder or any holder of an old order right fails to rehabilitate or to manage any impact on the environment, or is unable to undertake such rehabilitation or to manage such impact, the Minister responsible for mineral resources may, upon written notice to such holder, use all or part of the financial provision contemplated in subsection (1) to rehabilitate or manage the environmental impact in question.
  - (3) Every holder must annually-
    - a. assess his or her environmental liability in a prescribed manner and must increase his or her financial provision to the satisfaction of the Minister responsible for mineral resources; and
    - b. submit an audit report to the Minister responsible for mineral resources on the adequacy of the financial provision from an independent auditor.
  - (4) (a) If the Minister responsible for mineral resources is not satisfied with the assessment and financial provision contemplated in this section, the Minister responsible for mineral resources may appoint an independent assessor to conduct the assessment and determine the financial provision. (b) Any cost in respect of such assessment must be borne by the holder in question.
  - (5) The requirement to maintain and retain the financial provision contemplated in this section remains in force notwithstanding the issuing of a closure certificate by the Minister responsible for mineral resources in terms of the Mineral and Petroleum Resources Development Act, 2002 to the holder or owner concerned and the Minister responsible for mineral resources may retain such portion of the financial provision as may be required to rehabilitate the closed mining or prospecting operation in respect of latent, residual or any other environmental impacts, including the pumping of polluted or extraneous water, for a prescribed period.
  - (6) The Insolvency Act, 1936 (Act No. 24 of 1936), does not apply to any form of financial provision contemplated in subsection (1) and all amounts arising from that provision.
  - (7) The Minister, or an MEC in concurrence with the Minister, may in writing make subsections (1) to (6) with the changes required by the context applicable to any other application in terms of this Act.
- Section 24R: Mine closure on environmental authorisation:
    - (1) Every holder, holder of an old order right and owner of works remain responsible for any environmental liability, pollution or ecological degradation, the pumping and treatment of polluted or extraneous water, the management and sustainable closure thereof notwithstanding the issuing of a closure certificate by the Minister responsible for mineral resources in terms of the Mineral and Petroleum Resources Development Act, 2002, to the holder or owner concerned.
    - (2) When the Minister responsible for mineral resources issues a closure certificate, he or she must return such portion of the financial provision contemplated in section 24P as the Minister may deem appropriate to the holder concerned, but may retain a portion of such financial provision referred to in subsection (1) for any latent, residual or any other environmental impact, including the pumping of polluted or extraneous water, for a prescribed period after issuing a closure certificate.
    - (3) Every holder, holder of an old order right or owner of works must plan, manage and implement such procedures and requirements in respect of the closure of a mine as may be prescribed.



- (4) The Minister may, in consultation with the Minister responsible for mineral resources and by notice in the Gazette, identify areas where mines are interconnected or their impacts are integrated to such an extent that the interconnection results in a cumulative impact.

The Minister may, by notice in the Gazette, publish strategies in order to facilitate mine closure where mines are interconnected, have an integrated impact or pose a cumulative impact.

#### 3.4.4 FINANCIAL PROVISIONING REGULATIONS

On 20<sup>th</sup> November 2015 the Minister promulgated the Financial Provisioning Regulations under the NEMA (GN R 1147, 2015). The regulations aim to regulate the determine and making of financial provision as contemplated in the NEMA for the costs associated with the undertaking of management, rehabilitation and remediation of environmental impacts from prospecting, exploration, mining or production operations through the lifespan of such operations and latent or residual environmental impacts that may become known in the future. These regulations provide for, inter alia:

- Determination of financial provision: An applicant or holder of a right or permit must determine and make financial provision to guarantee the availability of sufficient funds to undertake rehabilitation and remediation of the adverse environmental impacts of prospecting, exploration, mining or production operations, as contemplated in the Act and to the satisfaction of the Minister responsible for mineral resources.
- Scope of the financial provision: Rehabilitation and remediation; decommissioning and closure activities at the end of operations; and remediation and management of latent or residual impacts.
- Regulation 6: Method for determining financial provision – An applicant must determine the financial provision through a detailed itemisation of all activities and costs, calculated based on the actual costs of implementation of the measures required for:
  - Annual rehabilitation – annual rehabilitation plan
  - Final rehabilitation, decommission and closure at end of life of operations – rehabilitation, decommissioning and closure plan; and
  - Remediation of latent defects and residual impacts – environmental risk assessment report.
- Regulation 10: An applicant must-
  - ensure that a determination is made of the financial provision and the plans contemplated in regulation 6 are submitted as part of the information submitted for consideration by the Minister responsible for mineral resources of an application for environmental authorisation, the associated environmental management programme and the associated right or permit in terms of the Mineral and Petroleum Resources Development Act, 2002; and
  - Provide proof of payment or arrangements to provide the financial provision prior to commencing with any prospecting, exploration, mining or production operations.
- Regulation 11: Requires annual review, assessment and adjustment of the financial provision. The review of the adequacy of the financial provision including the proof of payment must be independently audited (annually) and included in the audit of the EMPR as required by the EIA regulations.

Appendix 4 of the Financial Provisioning Regulations provides the minimum content of a final rehabilitation, decommissioning and closure plan. This FRDCP has been prepared to align with these requirements. Appendices 3 and 5 of the Financial Provisioning Regulations provide content requirements for the Annual Rehabilitation Plan and Environmental Risk Assessment Report respectively.



### 3.4.5 OTHER GUIDELINES

The following additional guidelines which relate to financial provisioning and closure have been published in the South African context:

- **Best Practice Guideline G5: Water Management Aspects for Mine Closure:** This guideline was prepared by the DWS and aims to provide a logical and clear process that can be applied by mines and the competent authorities to enable proper mine closure planning that meets the requirements of the relevant authorities. This guideline is aimed primarily at larger scale mines and does not specifically address closure issues related to closure of exploration activities, however certain principles related to closure and water management are relevant. The following technical factors which should be considered during closure, and those which are likely to relate to exploration activities, have been considered:
  - Land use plan: directly interlinked with water management issues insofar as water is required to support the intended land use- in this regard the surrounding communities and the land uses implemented rely on available ground and surface water to be sustained. Management of water quality and quantity has been identified as an aspect to be covered in this FRDCP.
  - Public participation and consultation: consultation is fundamental to closure and there is a need for full involvement of stakeholders in the development of the final closure plans, and in the agreement of closure objectives- in this regard this FRDCP has been made available through the EIA public participation process for comment by relevant stakeholders.
- **Guideline for the Evaluation of the Quantum of Closure Related Financial Provision Provided by a Mine:** The objectives of the guideline include the need to improve the understanding of the financial and legal aspects pertaining to the costing of remediation measures as a result of mining activities. Whilst this guideline predates the recent NEMA Financial Provisioning Regulations, it does contain certain principles and concepts that remain valid and have been considered in this FRDCP.

### 3.4.6 ALTERNATIVE CLOSURE AND POST CLOSURE OPTIONS

There are various alternative closure and post closure options available. The identification and consideration of the most suitable alternatives are driven by, inter alia the following considerations:

- The ability of the selected alternative to adequately meet the specified closure vision and objectives.
- The efficiency, viability, and practicality of the selected alternative.
- The alignment with the local environmental and socio-economic context and associated opportunities and constraints.

Table 11 presents some available options and alternatives related to the process of abandoning and closure of a prospecting site. This reassessment must be utilised to select the most appropriate and responsible closure option. The options in the table below that are marked with an “X” are considered the preferred options.

Table 11: Closure Alternatives.

Prospecting Activity	Aspect	Options	Comment
Prospecting Boreholes	Closure	Yes	The main aim in developing this rehabilitation plan is to mitigate the impacts caused by the prospecting activities and to restore land back to a satisfactory standard. It is best practice to develop the rehabilitation plan as early as possible so as to ensure the optimal management of rehabilitation issues that may arise. It is important that the projects closure plan is defined and understood from before



Prospecting Activity	Aspect	Options	Comment
			<p>starting the process and is complementary to the rehabilitation goals. Rehabilitation and closure objectives need to be tailored to the project at hand and be aligned with the EMPr. The overall rehabilitation objectives for this project are as follows:</p> <p>Maintain and minimise impacts to the ecosystem within the study area;</p> <p>Re-establishment of the pre-developed land capability to allow for a suitable post- prospecting land use;</p> <p>Prevent soil, surface water and groundwater contamination;</p> <p>Comply with the relevant local and national regulatory requirements; and</p> <p>Maintain and monitor the rehabilitated areas.</p>
		No	The option of not rehabilitating the mined areas, leaving the risks such as contamination of watercourses, establishment and spread of alien vegetation, safety risk to humans and animals unmitigated.
	Surface Infrastructure	Complete removal	In order to allow unhindered land use of the prospecting area, it is suggested that all surface infrastructure be removed.
		Retain	Surface infrastructure would typically remain for possible future use by the landowner or the applicant.
	Access roads	Rehabilitate	The intention is to rehabilitate the area, including the access route, to the pre- prospecting condition.
		Retain	In certain instances, the landowner may request the retention of the access route.

As mentioned previously the final closure and decommissioning of a prospecting site must be pre-empted by a site-specific assessment and where applicable the implementation of the most appropriate rehabilitation and closure strategy. Furthermore, the annual review of this FRDCP must where applicable include an assessment and adjustment of the closure strategy to reflect the most recent technical development and industry best practice, as well as any lessons learnt from the implementation of closure on this project.

### 3.4.7 MOTIVATION FOR PREFERRED CLOSURE OPTION

With reference to Sections 3.4.6 and 3.4.7 the preferred closure option is as follows:

- In line with the DWAF (2008). Best Practice Guideline A6: Water Management for Underground Mines, all prospecting boreholes that will not be required for later monitoring or other useful purposes should be plugged and sealed with cement to prevent possible cross flow and contamination between aquifers;
- In order to allow unhindered land use of the prospecting area, it is suggested that all surface
- infrastructure be removed; and
- Rehabilitate access routes.



It is anticipated that the closure option presented above, together with monitoring over a 2 year post closure period, will achieve the stipulated closure objective. This closure option is in line with industry best practice and the requirements of the MPRDA Regulations.

### 3.4.8 CLOSURE PERIOD AND POST CLOSURE REQUIREMENTS

The closure period is defined as the period between the cessation of prospecting activities, and the completion of active rehabilitation actions on the applicable site. It is important to note that the nature of prospecting drilling is such that closure may be implemented for individual boreholes as and when the analysis ends.

Following successful completion of the active closure actions it is suggested that a further post closure period be assigned to allow for monitoring of the success of closure. It is anticipated that a period of 2 years be permitted for ongoing post closure monitoring. This post closure monitoring will include the following:

- Inspection of borehole plug integrity; and
- Vegetation composition.

### 3.4.9 ASSUMPTIONS AND LIMITATIONS

The following assumptions and limitations apply to this FRDCP:

- The following assumptions have been made and used as the basis for the financial provision calculations:
  - Post closure land use to resemble the pre-prospecting land use and vegetative cover;
  - Depth per borehole: ~2400m (x16 RAB boreholes) and ~2000m (4x DD boreholes);
  - Distance of access track (requiring rehabilitation): ~10 km total;
  - The access roads prepared for the prospecting activities will be rehabilitated during closure;
  - The closure actions and associated period will commence as soon as a borehole is abandoned; and
  - It is assumed that the entire length and diameter of the prospecting borehole will be plugged/ cemented.
- It is assumed that the management and mitigation measures suggested in the BAR relating to ongoing environmental management will be complied with. This includes post drilling clean-up and rehabilitation; and
- It is assumed that the drilling, will be carried out in accordance with industry best practice and that permeable zones are adequately isolated (including the usable ground water aquifers).

## 3.5 FINAL POST PROSPECTING LAND USE

As discussed above the final post closure land use will depend on the specific site circumstances. It is proposed that prior to initiating closure that a suitably qualified specialist is appointed to undertake an assessment and consult with the landowner, and prepare a site specific decommissioning plan for submission to DMR for review and approval. For the purposes of this FRDCP it is assumed that the post closure land use will be natural veld primarily utilised for livestock grazing or else vacant land.

## 3.6 CLOSURE ACTIONS

### 3.6.1 INTEGRATED REHABILITATION AND CLOSURE PLAN

The main aim in developing this rehabilitation plan is to mitigate the impacts caused by the prospecting activities and to restore land back to a satisfactory standard. It is best practice to develop the rehabilitation plan as early as possible so as to ensure the optimal management of rehabilitation issues that may arise. It is important that the project's closure plan is defined and understood before starting the process and is complementary to the



rehabilitation goals. Rehabilitation and closure objectives need to be tailored to the project at hand and be aligned with the EMPr. The overall rehabilitation objectives for this project are as follows:

- Maintain and minimise impacts to the ecosystem within the study area;
- Re-establishment of the pre-developed land capability to allow for a suitable post- prospecting land use;
- Prevent soil, surface water and groundwater contamination;
- Comply with the relevant local and national regulatory requirements; and
- Maintain and monitor the rehabilitated areas.

Successful rehabilitation must be sustainable, and requires an understanding of the basic baseline environment, as well as project management to ensure that the rehabilitation program is a success.

### 3.6.2 PHASE 1: MAKING SAFE

In line with the DWAF (2008). Best Practice Guideline A6: Water Management for Underground Mines. All prospecting boreholes that will not be required for later monitoring or other useful purposes should be plugged and sealed with cement to prevent possible cross flow and contamination between aquifers. Cement and liquid concrete are hazardous to the natural environment on account of the very high pH of the material, and the chemicals contained therein. As a result, the contractor shall ensure that:

- Concrete shall not be mixed directly on the ground;
- The visible remains of concrete, either solid, or from washings, shall be physically removed immediately and disposed of as waste, (Washing of visible signs into the ground is not acceptable); and
- All excess aggregate shall also be removed.

### 3.6.3 PHASE 2: LANDFORM DESIGN, EROSION CONTROL AND REVEGETATION

Landform, erosion control and re-vegetation is an important part of the rehabilitation process. Landform and land use are closely interrelated, and the landform should be returned as closely as possible to the original landform. Community expectations, compatibility with local land use practices and regional infrastructure, or the need to replace natural ecosystems and faunal habitats all support returning the land as closely as possible to its original appearance and productive capacity. This requires the following:

- Shape, level and de-compact (where necessary) the final landscape after removing all the project infrastructure, dress with topsoil and, where necessary, vegetate with indigenous species. Commission specialists to assist in planning re-vegetation and the management of environmental impact, as required.
- Remove access roads with no beneficial re-use potential by deep ripping, shaping and levelling after the removal and disposal of any culverts, drains, ditches and/or other infrastructure. Natural drainage patterns are to be reinstated as closely as possible.
- Shape all channels and drains to smooth slopes and integrate into the natural drainage pattern.
- Construct contour banks and energy dissipating structures as necessary to protect disturbed areas from erosion prior to stabilisation.
- Promote re-vegetation through the encouragement of the natural process of secondary succession.
- Natural re-vegetation is dependent on de-compaction of subsoils and adequate replacement of the accumulated reserves of topsoil (for example, over the borehole sites), so as to encourage the establishment of pioneer vegetation.
- Remove alien and/or exotic vegetation.
- Undertake a seeding programme only where necessary, and as agreed with the re-vegetation specialist.



### 3.6.4 PHASE 3: MONITORING AND MAINTENANCE

The post-operational monitoring and management period following decommissioning of prospecting activities must be implemented by a suitable qualified independent party for a minimum of two (2) year unless otherwise specified by the competent authority.

The monitoring activities during this period will include but not be limited to:

- Biodiversity monitoring; and
- Re-vegetation of disturbed areas where required.

Provision must be made to monitor any unforeseen impact that may arise as a result of the proposed prospecting activities and incorporated into post closure monitoring and management.

### 3.6.5 POST-CLOSURE MONITORING AND MAINTENANCE

Prior to decommissioning and rehabilitation activities, a monitoring programme shall be developed and submitted to the relevant authority for approval, as a part of the Final Rehabilitation Plan. The programme is to include proposed monitoring during and after the closure of the prospecting sites and related activities. It is recommended that the post-closure monitoring include the following:

- Confirmation that any waste, wastewater or other pollutants that is generated as a result of decommissioning will be managed appropriately, as per the detailed requirements set out in the Final Rehabilitation Plan;
- Confirmation that all de-contaminated sites are free of residual pollution after decommissioning;
- Confirmation that acceptable cover has been achieved in areas where natural vegetation is being re-established;
- ‘Acceptable cover’ means re-establishment of pioneer grass communities over the disturbed areas at a density similar to surrounding undisturbed areas, non-eroding and free of invasive alien plants; and
- Confirmation that the prospecting borehole sites are safe and are not resulting in a pollution hazard.

Annual environmental reports will be submitted to the Designated Authority and other relevant Departments for at least one year post-decommissioning. The frequency and duration of this reporting period may be increased to include longer term monitoring, at intervals to be agreed with the Designated Authority.

The monitoring reports shall include a list of any remedial action necessary to ensure that infrastructure that has not been removed remains safe and pollution free and that rehabilitation of project sites are in a stable, weed and free condition.

## 3.7 FINAL REHABILITATION, DECOMMISSIONING AND CLOSURE SCHEDULE

Table 12 below presents the forecast Schedule of actions related to the final rehabilitation, decommissioning and closure, in relation to the overall forecast prospecting schedule. It should be noted that this schedule represents a cautious approach and therefore doesn’t take into consideration the recommendation that final rehabilitation, decommissioning and closure may be initiated earlier in the prospecting process for individual borehole sites.

Table 12: Timeframes each of the proposed activities

Phase	Activity	Year 1	Year 2	Year 3	Year 4	Year 5
Phase 1 (Month 1-12)	<b>Non-Invasive Prospecting</b>	X				
	Desktop Study: Literature Survey / Review / acquisition of data					



Phase	Activity	Year 1	Year 2	Year 3	Year 4	Year 5
<b>Phase 2</b> <b>(Month 6 - 12)</b>	<b><u>Non-Invasive Prospecting</u></b> Geological Field Mapping	X				
<b>Phase 3</b> <b>(Month 12 - 24)</b>	<b><u>Non-Invasive Prospecting</u></b> Semi-regional Ground Geophysical Survey		X			
<b>Phase 4</b> <b>(Month 24-34)</b>	<b><u>Invasive Prospecting</u></b> Exploration Boreholes			X		
<b>Phase 5</b> <b>(Month 34-36)</b>	<b><u>Non-Invasive Prospecting</u></b> Compilation, interpretation and modelling of data			X		
<b>Phase 6</b> <b>(Month 36-42)</b>	<b><u>Non-Invasive Prospecting</u></b> Detailed Ground Geophysical Survey on individual positively mineralized targets to define possible extent				X	
<b>Phase 7</b> <b>(Month 42-48)</b>	<b><u>Invasive Prospecting</u></b> Boreholes to confirm continuity of mineralization & potential deposit size				X	
<b>Phase 8</b> <b>(Month 48-60)</b>	<b><u>Invasive Prospecting</u></b> Resource definition drilling					X
<b>Phase 9</b> <b>(Month 54-60)</b>	<b><u>Non-Invasive Prospecting</u></b> Analytical Desktop Pre-Feasibility Study					X

### 3.8 ORGANISATIONAL CAPACITY

Capacity of the following key roles and responsibilities must be provided for:

- The Applicant: The applicant is ultimately responsible for ensuring compliance with all the provisions of the prospecting right and associated plans, as well as other relevant legal requirements. The Applicant must ensure knowledge and understanding of the applicable legislation, guidelines and industry best practices. Where necessary the applicant must appoint suitably qualified specialists, engineers, and other internal and external resources to adequately comply with the applicable commitments and requirements. Relevant commitments made and obligations contained within the legal requirements must be adequately planned and budgeted for. The applicant must also ensure that suitable structures are put in place to effectively communicate with the affected landowners and relevant stakeholders.
- Independent Environmental Assessment Practitioner: This individual will be appointed to ensure compliance with the requirements of the FRDCP and specifically to undertake the following tasks:



- Undertake the required pre-closure environmental site assessment, risk assessment, and landowner consultations.
- Prepare a site specific final closure and decommissioning plan.
- Undertake the required periodic compliance monitoring and reporting during the closure period.
- **Prospecting specialist:** This individual must be a suitably qualified professional who must have relevant experience in prospecting. Key attributes must include experience and qualifications related to the technologies applicable to prospecting site closure, as well as a thorough understanding of internationally accepted closure standards and guidelines. This specialist will be responsible for ensuring that the closure plan is implemented to ensure that the risks to the environment and surrounding communities are prevented or limited.

Further education, training and capacity building is critical to ensure that the prospecting activities align with evolving internally accepted best practice and research. In this regard the Applicant must ensure that regular review of international best practice is undertaken and where applicable implemented throughout the prospecting programme.

### 3.9 IDENTIFICATION OF CLOSURE PLAN GAPS

The key gaps applicable to this closure plan are as follows:

- The geological stratigraphy and nature of the borehole profiles is unknown. The specific geological stratigraphy will be a determining factor in the planning for closure and decommissioning.
- The impact that any existing boreholes may have on the receiving environment is unknown.

The following actions have been proposed to address these gaps:

- A detailed drilling log will be prepared and maintained for each of the boreholes to ensure that the specific geological stratigraphy and sub-surface conditions are considered and inform the final site specific closure and decommissioning plan.
- A site specific closure and decommissioning plan will be prepared for each invasive activities and will where applicable be informed by a specialist environmental site assessment, and risk assessment, as well as a specialist assessment and plan for borehole plugging and decommissioning.

Furthermore, the financial provisioning regulations requires that the FRDCP be revisited, assessed, and revised on an annual basis. This annual review must aim to ensure that the gaps identified above are addressed, as applicable, and the relevant financial provisioning updated.

### 3.10 RELINQUISHMENT CRITERIA

Relinquishment can be defined as the formal approval by the relevant regulating authority indicating that the completion criteria for the prospecting activity have been met to the satisfaction of the authority. In this regard the relinquishment criteria are driven by the objectives of closure and consequently the indicators applicable to each impact associated with the closure and decommissioning of the prospecting boreholes. In this regard reference is made to Table 10 which presents each identified environmental impact, the associated indicators and proposed closure targets. In summary the proposed relinquishment criteria include:

- **Biodiversity and soils:** The vegetation cover of the affected areas must be consistent with surrounding vegetative cover. There must be ecosystem functionality which is consistent with the surroundings. There must be no faunal mortalities associated with the prospecting activities.
- **Social:** There must be no unattended complaints. Where possible written confirmation from the affected landowner must be solicited confirming that outstanding issues have been addressed and closed out.
- **Waste:** There must be no waste materials remaining on site.



- Groundwater: Closure report from contractor that boreholes have been plugged.

### 3.11 CLOSURE COST - FRDCP

At any time, funds must be available for the amount of 10 years of the calculation of the sum of the rehabilitation calculation. The remainder of this section provides details on the proposed closure cost. The assumptions and limitations stated in Section 3.4.9 and Section 3.11.3, also underpin the basis of this closure cost determination.

#### 3.11.1 CLOSURE COST METHODOLOGY

The closure cost has been calculated through the following steps:

- Applicable prospecting activities are listed;
- Applicable closure actions listed for each activity;
- Cost items are listed for each action;
- Cost units and rates determined for each item (where possible on the basis of actual quotations); and
- Total cost is calculated.

#### 3.11.2 CLOSURE COST ESTIMATION

This closure cost is based on 2026 values and will require annual reassessment, revision and escalation. The preliminary estimate of the Rehabilitation Cost is (inclusive of contingencies and VAT): **R 851,979.86**. Please refer to Appendix 1 for the detailed breakdown of the anticipated closure cost for 20 boreholes.

**IMPORTANT:** The quantum of financial provision must be reviewed and updated on an annual basis to reflect the existing and planned (for the upcoming year) environmental liabilities. In this respect it must be noted that the applicant only plans to implement the invasive exploration activities in year 3 onwards. Consequently there is no environmental liability for which financial provision needs to be made for the first 2 years. Therefore the quantum to be set aside for financial provision for year 1 is R0.

#### 3.11.3 CLOSURE COST ASSUMPTIONS AND LIMITATIONS

In accordance with the prospecting activities description, the following activities are included, and their associated cost assumptions:

- The following assumptions have been made and used as the basis for the financial provision calculations:
  - Post closure land use to resemble the pre-prospecting land use and vegetative cover;
  - Depth per borehole: ~2400m (x16 RAB boreholes) and ~2000m (x4 DD boreholes);
  - Distance of access track (requiring rehabilitation): ~10 Km in total;
  - The access roads prepared for the prospecting activities will be rehabilitated during closure;
  - The closure actions and associated period will commence as soon as a borehole is abandoned;
  - It is assumed that the entire length and diameter of the prospecting borehole will be plugged/ cemented;
  - It is assumed that the Environmental Site Inspection and assessment in preparation of closure be conducted by a BMM Senior Environment Officer, already in the employ of BMM and will be travelling from Aggeneys;
  - Costing for monitoring is based on an ecologist based in Upington.
- It is assumed that the management and mitigation measures suggested in the BAR relating to ongoing environmental management will be complied with. This includes post drilling clean-up and rehabilitation; and



- It is assumed that the drilling, will be carried out in accordance with industry best practice and that permeable zones are adequately isolated (including the usable ground water aquifers).

### 3.12 MONITORING, AUDITING AND REPORTING

The requirement to monitor and audit should be carried through all phases of the proposed prospecting activities. In this regard the following monitoring and auditing requirements for the pre-closure phases have been specified in the BAR and EMPr (please refer to the BAR and EMPr for further detail):

- Compliance monitoring and auditing:
  - In accordance with Regulation 26 of the NEMA EIA regulations the competent authority will indicate the extent and frequency of required environmental audits in any consequent environmental authorisations. For the purposes of this submission the following is proposed:
    - The Site Manager (normally the Project Geologist) will be responsible for daily monitoring, culminating in weekly reports which will be filed in support of an overall monthly report, which is to be submitted to the BMM Environmental Officer. Compliance with the BAR & EMPR will be audited quarterly by the BMM Environmental Officer. The officer will be responsible for quarterly site inspections and reports, culminating in the compilation of the annual performance assessment report which is to be submitted to the DMR, as per legal requirement. The results of these inspections will be documented and kept on record for the life of the prospecting operation. External audits in the form of EMP performance assessments will be conducted every two years by an independent consultant and submitted to the DMR.
- Environmental Monitoring (as detailed in the BAR and EMPr):
  - Waste Management; and
  - Progressive rehabilitation.
- Review and update of Final Rehabilitation, Decommissioning and Closure Plan:
  - In accordance with Regulation 11 of the NEMA Financial Provisioning Regulations the Applicant must ensure annual review of the annual rehabilitation plan, the final rehabilitation decommissioning and closure plan, as well as the environmental risk assessment. This annual review must be audited by an independent auditor.

It is critical to continue monitoring through to the post- closure phase of the prospecting activities. The aim of this being to ensure that the objectives of the rehabilitation and closure plan are met. In this regard the following actions, to be adjusted based on the completion of the pre-closure site assessment, are proposed:

- Compliance monitoring and auditing: Annual (or as agreed) environmental reports will be submitted to the competent authority and other relevant stakeholders for at least 2 years post-decommissioning. The monitoring reports shall include a list of any remedial action necessary to ensure that infrastructure that has not been removed remains safe and pollution free and that rehabilitation of project sites are in a stable, weed free condition.
- Environmental Monitoring:
  - Flora: Biodiversity assessments mid wet season should be undertaken by the ECO to monitor the rehabilitation progress with regards to flora. Confirmation that acceptable cover has been achieved in areas where natural vegetation is being re-established. 'Acceptable cover' means re-establishment of pioneer grass communities over the disturbed areas at a density similar to surrounding undisturbed areas, non-eroding and free of invasive alien plants.



## 4 ANNUAL REHABILITATION PLAN

The annual rehabilitation plan aims to:

- a) review concurrent rehabilitation and remediation activities already implemented;
- b) establish rehabilitation and remediation goals and outcomes for the forthcoming 12 months, which contribute to the gradual achievement of the post-prospecting land use, closure vision and objectives identified in the holder's final rehabilitation, decommissioning and mine closure plan;
- c) establish a plan, schedule and budget for rehabilitation for the forthcoming 12 months;
- d) identify and address shortcomings experienced in the preceding 12 months of rehabilitation; and
- e) evaluate and update the cost of rehabilitation for the 12 month period and for closure, for purposes of supplementing the financial provision guarantee or other financial provision instrument.

## 5 ENVIRONMENTAL RISK ASSESSMENT – LATENT AND RESIDUAL ENVIRONMENTAL IMPACTS

According to the Financial Provisioning Regulations (2015) the objective of the environmental risk assessment report that relates to latent and residual impacts is to:

- a) ensure timeous risk reduction through appropriate interventions;
- b) identify and quantify the potential latent environmental risks related to post closure;
- c) detail the approach to managing the risks;
- d) quantify the potential liabilities associated with the management of the risks; and
- e) outline monitoring, auditing and reporting requirements.

This section of the report aims to address these objectives separately in cases where they have not been considered in previous sections.

### 5.1 THE ASSESSMENT PROCESS USED AND DESCRIPTION OF LATENT ENVIRONMENTAL RISK

Section 7 of the BAR provides a detailed description of the environmental impact/risk identification and assessment (including the methodology and findings) undertaken for the proposed prospecting activities. Further details of the risk assessment methodology are detailed in the Environmental Risk Assessment under Section 3.2 of this report. As mentioned under Section 3.2, the BAR and EMPr have identified mitigation measures which, once implemented successfully, will result in the avoidance or acceptable reduction of the associated impact.

The drivers that could result in the manifestation of the latent risk are largely defined by the specifics of the site location and the geological profile surrounding each specific site. It is suggested that further investigations are conducted during annual revisions, as well as during the proposed site specific environmental assessment detailed in Section 3.9 of this document to provide more clarity on this specific issue. These investigations must include regular revision of the environmental risk assessment and consequently inform the responsible management of latent and residual impacts.

### 5.2 MANAGEMENT ACTIVITIES, COSTING AND MONITORING REQUIREMENTS

New international best practice guidelines that may be developed in the future (Section 3.4.6), will be considered in all annual updates of the financial provisions and changes to the risk assessment will be reported on. In addition, monitoring results and auditing reports, as described under Section 3.6.3, for two years after closure will inform the revised risk assessment further.



## Appendix 1: Cost Estimate

## Cost Estimate

Item #	Activity	Item	Type	Cost Item	Comments	Number	Unit Price	Cost (Excl VAT)
1	Phase 1: Preparation for closure	Environmental Site Inspection and assessment	Work	BMM Senior Environmental Officer	Hours	24	R 0,00	R 0,00
			Material	Mileage	km	306	R 7,92	R 2 423,92
2	Phase 2: Closure and rehabilitation	Borehole plugging	Material	Groundworks & Rehabilitation - Plugging and grouting the borehole	Exploration Boreholes (16 RAB holes – 2400m; 4 Diamond Drill (DD) holes – 2000m)	20	R 14 402,36	R 288 047,14
			Material	Equipment & Crew Mobilisation		20	R 7 674,48	R 153 489,59
			Material	Equipment & Crew Demobilisation		20	R 4 286,92	R 85 738,33
			Material	Waste bin transport	Bin placement and collection	20	R 647,94	R 12 958,86
			Material	Waste bin rental	per day	60	R 648,11	R 38 886,36
			Material	Waste disposal (per ton)	Disposal at BMM Licenced waste disposal facility	6	R 0,00	R 0,00
		Access road rehabilitation	Material	Equipment- Earth moving	BMM equipment utilised for rehabilitation work	10	R 12 962,12	R 129 621,21
3	Phase 3: Monitoring, Maintenance and Relinquishment	Vegetation monitoring	Work	Specialist: Ecology	SACNASP registered ecologist/ botanist. Survey undertaken once per annum, Upington based practitioner	52	R 1 080,18	R 56 169,19
			Material	Mileage	2 Return trips to site.	908	R 7,92	R 7 192,54
Professional Fees								R 56 169,19
Expenses								R 718 357,95
<b>TOTAL COST (EXCL VAT)</b>								<b>R 774 527,14</b>
<b>TOTAL COST + 10% CONTINGENCY (EXCL VAT)</b>								<b>R 851 979,86</b>
<b>TOTAL COST + 10% CONTINGENCY (INCL VAT)</b>								<b>R 979 776,84</b>