mineral resources & energy
Department:
Mineral Resources and Energy
REPUBLIC OF SOUTH AFRICA

# FINAL

# BASIC ASSESSMENT REPORT

## And

# ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

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

**NAME OF APPLICANT: XHARIEP PLANT AND MINING (PTY) LTD**

**TEL NO: 053 874 3820**
**FAX NO: 053 874 3820**
**POSTAL ADDRESS: P.O. BOX 1776, KIMBERLEY, 8300**
**PHYSICAL ADDRESS: 1 UITZIGHT STREET, ROYLGLEN, KIMBERLEY, 8301**
**FILE REFERENCE NUMBER SAMRAD: (NC) 30/5/1/1/2/13476 PR**

## IMPORANT NOTICE

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

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

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

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

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

## OBJECTIVE OF THE BASIC ASSESSMENT PROCESS

The objective of the basic assessment process is to, through a consultative process:-

a) determine the policy and legislative context within which the proposed activity is located and how the activity complies with and responds to the policy and legislative context;

b) identify the alternatives considered, including the activity, location, and technology alternatives;

c) describe the need and desirability of the proposed alternatives;

d) through the undertaking of an impact and risk assessment process inclusive of cumulative impacts which focused on determining the geographical, physical, biological, social, economic, heritage, and cultural sensitivity of the sites and locations within sites and the risk of impact of the proposed activity and technology alternatives on these aspects to determine:

   (i) the nature, significance, consequence, extent, duration, and probability of the impacts occurring to; and
   (ii) the degree to which these impacts:-
      (aa) can be reversed;
      (bb) may cause irreplaceable loss of resources; and
      (cc) can be managed, avoided or mitigated;

e) through a raking of the site sensitivities and possible impacts the activity and technology alternatives will impose on the sites and location identified through the life of the activity to:-
   (i) identify and motivate a preferred site, activity and technology alternative;
   (ii) identify suitable measures to manage, avoid or mitigate identified impacts; and
   (iii) identify residual risks that need to be managed and monitored.

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## PART A
## SCOPE OF ASSESSMENT AND BASIC ASSESSMENT REPORT

Contact Person and correspondence address:

**a) Details of:**

**i) The EAP who prepared the report:**

Name of the Practitioner: Tanja Jooste
M and S Consulting (Pty) Ltd
Tel No: 053 861 1765
Fax No: 086 636 0731
Cell No: 084 444 4474 – Ms. T. Jooste
E-Mail address: ms.consulting@vodamail.co.za

**(i) Expertise of the EAP:**

(1) The qualifications of the EAP:
(With evidence attached as Appendix 1)

- Professional registration of EAP:
  Ms. Jooste is a registered EAP with the Environmental Assessment Practitioners Association of South Africa (EAPASA) (Reg. No. 2019/1983).

- The qualifications of the EAP:
  - Fifteen years professional experience, in terms of Section 15(1) of the National Environmental Management Act, 1998 (Act No. 107 of 1998), Section 24H Registration Authority Regulations as published on 22 July 2016 under Government Gazette No. 40154 (849);
  - Environmental Management Certificate; and
  - BA in Environmental Management.

(2) Summary of the EAP's past experience:
(Attach the EAP's curriculum vitae as Appendix 2)

Relevant past experiences in carrying out the Environmental Impact Assessment Procedures include Environmental Impact Assessments, Environmental Management Plans / Programmes / Reports, Performance Assessments, Rehabilitation Progress Assessments, Environmental Liability Assessments, Environmental Compliance Monitoring, Scoping Reports, etc.

**b) Location of the overall activity:**

| | |
|---|---|
| Farm Name: | Farm Stofbakkies Public Outspan 30<br>('PR Area') |
| Application area (Ha) | 1 415.8474 Hectares |
| Magisterial district: | Prieska |
| Distance and direction from nearest town | The PR Area is situated immediately north of the town of Prieska, opposite the Orange River.<br><br>Access to the site can be obtained from the R313 |
| 21 digit Surveyor General Code for each farm portion | C06000000000003000000 |

## c) Locality Map:

(show nearest town, scale not smaller than 1:250 000 attached as Appendix 3)

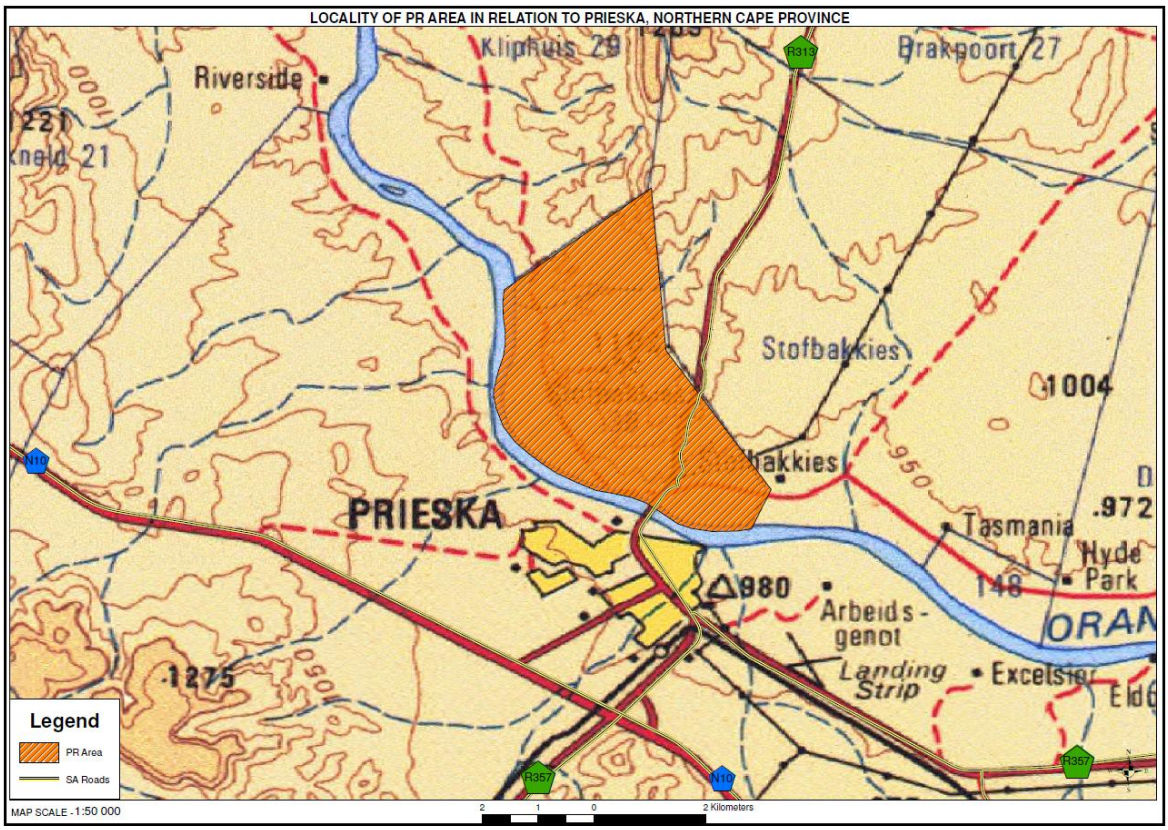


Figure 1 – Locality Map

## d) Description of the scope of the proposed overall activity:

### i) Listed and specified activities:

(Provide a plan drawn to a scale acceptable to the competent authority but not less than 1:10 000 that shows the location, and area (hectares) of all the aforesaid main and listed activities, and infrastructure to be placed on site and attach as Appendix 4)

A detailed Site Plan cannot be provided in this early stage of the application process as the locality of the invasive prospecting activities is dependent on the results of the non-invasive prospecting activities.

We do; however; insert below a Conceptual Site Plan indicating all existing infrastructure (i.e. roads) as well as sensitive environmental features to assist with planning when the results of the abovementioned stages have been obtained. No prospecting related infrastructure will be established at the site.

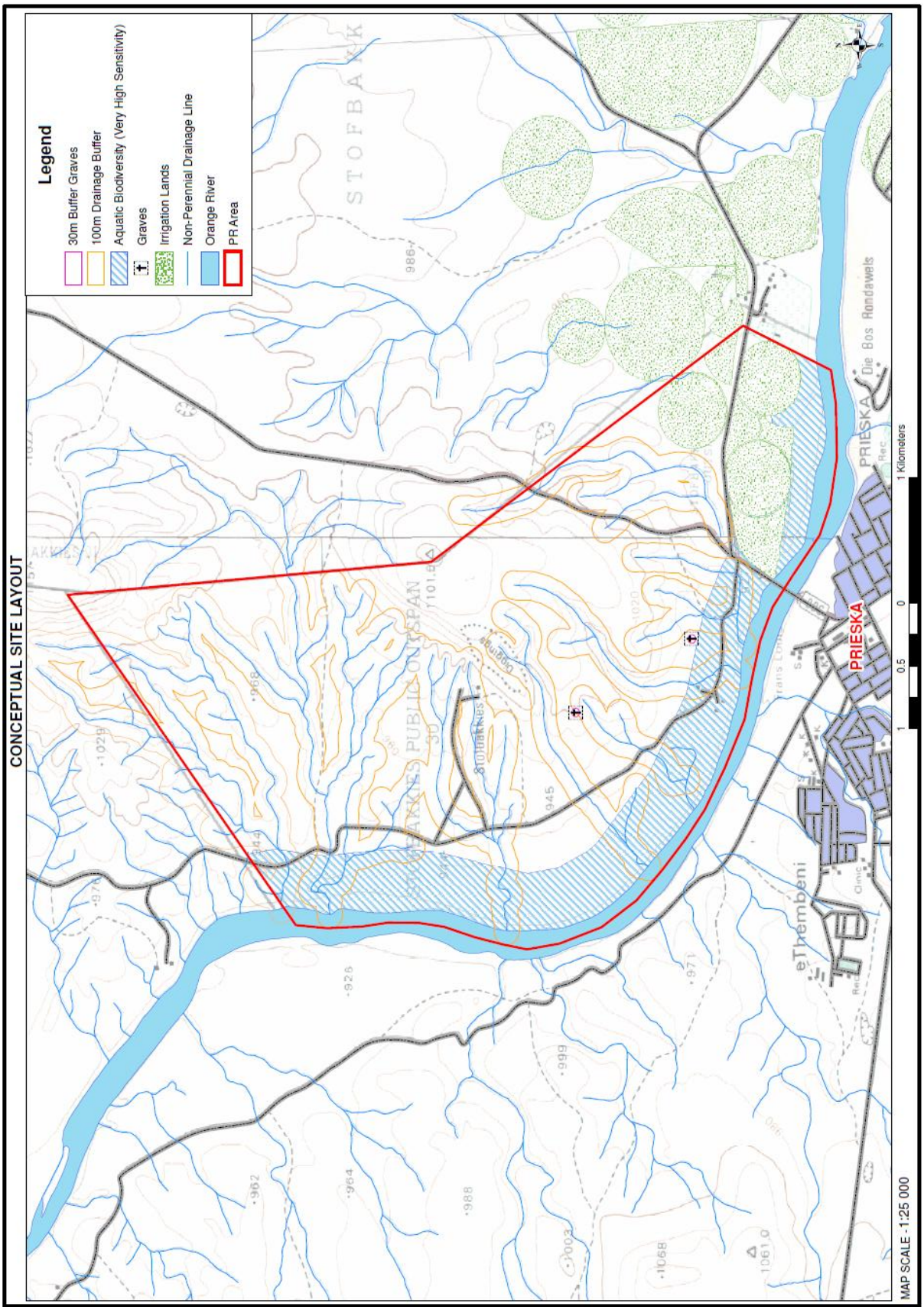


Figure 2 – Conceptual site layout plan

| Name of activity (e.g. Excavations, blasting, stockpiles, discard dumps or dams, loading, hauling and transport, water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.) | | Aerial extent of the activity (Ha or m²) | Listed Activity (mark with an X where applicable or affected) | Applicable Listing Notice (GNR544, GNR545 or GNR546 / Not listed) |
|---|---|---|---|---|
| 1 | Boreholes:<br>- Percussion: 20 boreholes with a 20m x 20m surface disturbance around each hole<br>- RC: 20 boreholes with a 20m x 20m surface disturbance around each hole | 16 000m² (1.6 Ha) | X | GNR327 – Activity 20<br>GNR327 – Activity 27 |
| 2 | Access tracks:<br>- Existing roads will be used as far as possible.<br>- It is anticipated that 500m long and 3m wide two-spoor access tracks will be created to access borehole localities. | 1 500m² (0.15 Ha) | X | GNR327 – Activity 20<br>GNR327 – Activity 27 |
| 3 | Chemical toilets | 6m² each | | |

Full description of listed activities applied for:

Full description of listed activities:

- GNR 327 – Activity 20: 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, 2002 (Act No. 28 of 2002), including
  a) associated infrastructure, structures and earthworks, directly related to prospecting of a mineral resource; or including activities for which an exemption has been issued in terms of Section 106 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002);
  b) the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing;
  but excluding the secondary processing of a mineral resource, including the smelting, beneficiation, reduction, refining, calcining or gasification of the mineral resource in which case Activity 6 of Listing Notice 2 applies.

- GN327: Activity 27: The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for:-
  (i) the undertaking of a linear activity; or
  (ii) maintenance purposes undertaken in accordance with a maintenance management plan.

## (ii) Description of the activities to be undertaken:

(Describe methodology or technology to be employed, and for a linear activity, a description of the route of the activity.)

Xhariep's prospecting activities for Diamond (Alluvial, General, In Kimberlite), shall be conducted in nine phases over a period of five years.

| Phase | Activity<br>(what are the activities that are planned to achieve optimal prospecting) | Skill(s) required<br>(refers to the competent personnel that will be employed to achieve the required results) | Timeframe<br>(in months) for the activity) | Outcome<br>(What is the expected deliverable, e.g. Geological report, analytical results, feasibility study, etc.) | Timeframe for outcome<br>(deadline for the expected outcome to be delivered) | What technical expert will sign off on the outcome?<br>(e.g. geologist, mining engineer, surveyor, economist, etc) |
|---|---|---|---|---|---|---|
| 1 | **Non-invasive Prospecting**<br>Reconnaissance visit | Geologist | Month 1 | Memorandum to address any problems | Month 2 | Geologist |
| 2 | **Non-invasive Prospecting**<br>Review of historical activities; Desktop study; and Geological Mapping | Geologist | Month 2 - 12 | Map & Report | Month 13 | Geologist |
| 3 | **Invasive Prospecting**<br>Phase 1 Percussion drilling | Geologist & Drilling contractor | Month 13 - 24 | Drill logs | Month 24 | Geologist |
| 4 | **Non-invasive Prospecting**<br>Analysis of drill samples | Laboratory | Month 13 – 24 (Concurrent with drilling) | • Analyses sheets<br>• Laboratory report<br>• Map<br>• Report | Month 24 | Laboratory & Geologist |
| 5 | **Invasive Prospecting**<br>Phase 2 RC drilling | Geologist & Drilling contractor | Month 25 – 36 | Drill logs | Month 36 | Geologist |
| 6 | **Non-invasive Prospecting**<br>Analysis of drill samples | Laboratory | Month 25 – 36 (Concurrent with drilling) | • Analyses sheets<br>• Laboratory report<br>• Map<br>• Report | Month 36 | Laboratory & Geologist |
| 7 | **Invasive Prospecting**<br>Phase 3 RC drilling | Geologist & Drilling contractor | Month 37 - 48 | Drill logs | Month 48 | Geologist |
| 8 | **Non-invasive Prospecting**<br>Analysis of drill samples | Laboratory | Month 37 - 48 (Concurrent with drilling) | • Analyses sheets<br>• Laboratory report<br>• Map<br>• Report | Month 48 | Laboratory & Geologist |
| 9 | **Non-invasive Prospecting**<br>Consolidation and interpretation of results / data | Geologist | Month 49 - 60 | Feasibility Report | Month 60 | Geologist & CEO |

Description of planned non-invasive activities:
(These activities do not disturb the land where prospecting will take place)

Phase 1:
A site investigation (reconnaissance visit) of the PR Area will be undertaken to identify infrastructure and determine any potential problems that may need to be addressed.

Phase 2:
In order to direct the exploration programme in an efficient manner, the following shall be done:

- Desktop study – A comprehensive study will be done researching all available information. A desktop study will be undertaken of the diamond potential of the area.
- Geological mapping - The geology of the PR Area will be interpreted by using aerial photographs and satellite images to ascertain target areas for possible gravel deposits and kimberlites. The area will then be mapped in detail by a qualified and registered geologist, which map shall include the various rock types and their contacts.
- Report – A report, making recommendations regarding further investigations of the mineralized areas will be compiled.

Phases 4, 6 and 8:
Samples will be obtained at 1m intervals from all of the boreholes and will be analyzed for a number of elements. In addition samples might also be used for the following:

- Petrographic Examination. Small samples (<5kg) collected from outcrops or boreholes may be submitted for petrographic examination.
- Small amounts of material (<10kg) from outcrops and drilling will be used to carry out physical property tests such as density.
- Geotechnical tests. Geotechnical investigations such as rock quality designation (RQD) and rock strength will be conducted on some of the drill material.

Phase 9:
All the drill sampling data will then be modelled to obtain a final interpretation of the potential of the deposit. A detailed feasibility report will be compiled after drilling operations have been completed to evaluate the economic viability of the project.

Description of planned invasive activities:
(These activities result in land disturbances)

Phase 3: Percussion drilling
Percussion drilling will be used to identify the position of a suspected gravel deposit. The position of the boreholes is dependent on the results of the review of historical activities, geological mapping, desktop study and reconnaissance visit.

Twenty boreholes, approximately 50m deep each (can be more or less depending on results), are planned. The collar position of all boreholes will be surveyed. All drilling will be short term and undertaken by a contractor using truck-mounted equipment.

Angled percussion holes are planned to locate and intersect the mineralization. A traverse line or grid drilling is used to identify and define the extent of any mineralization. The sizes of the boreholes drilled will be determined by such factors as cost, proposed sampling, availability of drilling machines and the volume of sample required, among others.

Each drill site will be rehabilitated. The boreholes will be filled with drill chips and covered with topsoil.

Phases 5 and 7: Reverse Circulation drilling
Diamond and/or Reverse Circulation will be drilled to delineate the potential economic zones of the gravel deposit. The position of the in-fill boreholes is dependent on the results of the percussion drilling phase.

Twenty boreholes, approximately 50m deep each (can be more or less depending on results), are planned (ten boreholes during phase 5 and ten boreholes during phase 7). The eventual extent of the gravel deposit, if one exists, will determine the number of boreholes to be drilled. The collar position of all boreholes will be surveyed. All drilling will be short term and undertaken by a contractor using truck-mounted equipment.

Angled RC holes are planned to locate and intersect the mineralization. A traverse line or grid drilling is used to identify and define the extent of any mineralization. The sizes of the boreholes drilled will be determined by such factors as cost, proposed sampling, availability of drilling machines and the volume of sample required, among others.

Each drill site will be rehabilitated. All shallow boreholes (i.e. <10m) will be backfilled and levelled. All boreholes deeper than 10m will be covered with a metal plate and 1000mm of previously stored topsoil.

Description of site layout:
No offices and storerooms will be established at the site as Xhariep Plant and Mining (Pty) Ltd (hereinafter referred to as 'Xhariep') shall make use of facilities in the town of Kimberley.

**e) Policy and Legislative Context:**

| Applicable Legislation and Guidelines used to compile the report<br>(a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process.) | Reference where applied |
|---|---|
| Conservation of Agricultural Resources Act (Act 43 of 1983) and Regulations | - Section 5: Implementation of control measures for alien and invasive plant species;<br>- Section 6: Control measures.<br>- Regulation GN R1048, published on 25 May 1984, in terms of CARA |
| Constitution of South Africa (Act 108 of 1996) | - Section 24: Environmental right<br>- Section 25: Rights in Property<br>- Section 27: Water and sanitation right |
| Environment Conservation Act (Act 73 of 1989) and Regulations | - Sections 21, 22, 25, 26 and 28: EIA Regulations, including listed activities.<br>- Section 28A: Exemptions. |
| Fencing Act (Act 31 of 1963) | - Section 17: States that any person erecting a boundary fence may clean any bush along the line of the fence up to 1.5m on each side thereof and remove any tree standing in the immediate line of the fence. However, this provision must be read in conjunction with the environmental legal provisions relevant to protection of flora. |
| Hazardous Substances Act (Act 15 of 1973) and Regulations read together with NEMA and NEMWA | - Definition, classification, use, operation, modification, disposal or dumping of hazardous substances. |
| Intergovernmental Relations Act (Act 13 of 2005) | - This Act establishes a framework for the National, Provincial and Local Governments to promote and facilitate intergovernmental relations. |
| Mine, Health and Safety Act (Act 29 of 1996) and Regulations | - Entire Act. |
| Mineral and Petroleum Resources Development Act (Act 28 of 2002) and Regulations as amended | - Entire Act.<br>- Regulations GN R527 |
| National Environmental Management Act (Act 107 of 1998) and Regulations as amended | - Section 2: Strategic environmental management principles, goals and objectives.<br>- Section 24: Foundation for Environmental Management frameworks.<br>- Section 24N:<br>- Section 24O: |

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| | - Section 28: The developer has a general duty to care for the environment and to institute such measures to demonstrate such care.<br>- Regulations GN R547, published on 18 June 2010 in terms of NEMA (Environmental Management Framework Regulations)<br>- Regulations GN R982 to R985, published on 4 December 2014 in terms of NEMA (Listed Activities)<br>- Regulations GN R993, published on 8 December 2014 in terms of NEMA (Appeal)<br>- Regulations GN R994, published on 8 December 2014 in terms of NEMA (exemption)<br>- Regulations GN R205, published on 12 March 2015 in terms of NEMA (National appeal Amendment Regulations)<br>- Regulations GN R1147, published on 20 November 2015 in terms of NEMA (Financial Provision) |
| National Environmental Management: Air Quality Act (Act 39 of 2004) | - Section 32: Control of dust<br>- Section 34: Control of noise<br>- Section 35: Control of offensive odours<br>- Regulation GN R551, published on 12 June 2015 (amended Categories 1 to 5 of GN 983) in terms of NEM:AQA (Atmospheric emission which have a significant detrimental effect on the environment)<br>- Regulation GN R283, published on 2 April 2015 in terms of NEM:AQA (National Atmospheric Emissions Reporting Regulations) (Group C-Mines) |
| National Environmental Management: Biodiversity Act (Act 10 of 2004) | - Section 52 of The National Environmental Management Act: Biodiversity Act (NEMBA) (Act 10 of 2004) states that the MEC/Minister is to list ecosystems that are threatened and in need of protection.<br>- Section 53 states that the Minister may identify any process or activity in such a listed ecosystem as a threatening process.<br>- A list of threatened and protected species has been published in terms of Section 56(1) GG 29657 GNR 151 and GNR 152, Threatened or Protected Species Regulations.<br><br>Commencement of Threatened or Protected Species Regulations 2007 : 1 June 2007<br>GNR 150/GG 29657/23-02-2007 |

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|---|---|
| | Publication of lists of critically endangered, vulnerable and protected species GNR 151/GG 29657/23-02-2007 *<br>Threatened or Protected Species Regulations<br>GNR 152/GG 296547/23-02-2007 *<br>- Sections 65 – 69: These sections deal with restricted activities involving alien species; restricted activities involving certain alien species totally prohibited; and duty of care relating to alien species.<br>- Sections 71 and 73: These sections deal with restricted activities involving listed invasive species and duty of care relating to listed invasive species.<br>- Regulation GN R151, published on 23 February 2007 (List fo Critically Endangered, Vulnerable and Protected Species, 2007) in terms of NEM: BA<br>- Regulation GN R152, published on 23 February 2007 (TOPS) in terms of NEM:BA<br>- Regulations GN R507 to 509 of 2013 and GN 599 of 2014 in terms of NEM:BA (Alien Species) |
| The National Environmental Management Act: Protected Areas Act (NEMPAA) (Act 57 of 2003) provides for the protection of ecologically viable areas that are representative of South Africa‟s natural biodiversity and its landscapes and seascapes. | - Chapter 2 lists all protected areas. |
| National Environmental Management: Waste Management Act (Act 59 of 2008) | - Chapter 4: Waste management activities<br>- Regulations GN R634 published on 23 August 2013 in terms of NEM:WA (Waste Classification and Management Regulations)<br>- Regulations GN R921 published on 29 November 2013 in terms of NEM:WA (Categories A to C – Listed activities)<br>- National Norms and Standards for the Remediation of contaminated Land and Soil Quality published on 2 May 2014 in terms of NEM:WA (Contaminated land regulations)<br>- Regulations GN R634 published on 23 August 2013 in terms of NEM: WA (Waste Classification and Management Regulations)<br>- Regulations GN R632 published on 24 July 2015 in terms of NEM: WA (Planning and Management of Mineral Residue Deposits and Mineral Residue Stockpiles) |

| | |
|---|---|
| | - Regulations GN R633 published on 24 July 2015 in terms of NEM: WA (Amendments to the waste management activities list published under GN921) |
| National Forest Act (Act 84 of 1998) and Regulations | - Section 15: No person may cut, disturb, damage, destroy or remove any protected tree; or collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, except under a licence granted by the Minister. |
| National Heritage Resources Act (Act 25 of 1999) and Regulations | - Section 34: No person may alter or demolish any structure or part of a structure which is older than 60 years without a permit issued by the relevant provincial heritage resources authority.<br>- Section 35: No person may, without a permit issued by the responsible heritage resources authority destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site.<br>- Section 36: No person may, without a permit issued by SAHRA or a provincial heritage resources authority destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a forma cemetery administered by a local authority.<br>- Section 38: This section provides for HIA which are not already covered under the ECA. Where they are covered under the ECA the provincial heritage resources authorities must be notified of a proposed project and must be consulted during HIA process.<br>- Regulation GN R548 published on 2 June 2000 in terms of NHRA |
| National Water Act (Act 36 of 1998) and and regulations as amended, *inter alia* Government Notice No. 704 of 1999 | - Section 4: Use of water and licensing.<br>- Section 19: Prevention and remedying the effects of pollution.<br>- Section 20: Control of emergency incidents.<br>- Section 21: Water uses<br>In terms of Section 21 a licence is required for:<br>(a) taking water from a water resource;<br>(b) storing water;<br>(c) impeding or diverting the flow of water in a watercourse;<br>(f) Waste discharge related water use;<br>(g) disposing of waste in a manner which may detrimentally impact on a water resource;<br>(i) altering the bed, banks, course or characteristics of a watercourse; |

| | |
|---|---|
| | (j) removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people; and;<br>- Regulation GN R704, published on 4 June 1999 in terms of the National Water Act (Use of water for mining and related activities)<br>- Regulation GN R1352, published on 12 November 1999 in terms of the National Water Act (Water use to be registered)<br>- Regulation GN R139, published on 24 February 2012 in terms of the National Water Act (Safety of Dams)<br>- Regulation GN R398, published on 26 March 2004 in terms of the National Water Act (Section 21 (j))<br>- Regulation GN R399, published on 26 March 2004 in terms of the National Water Act (Section 21 (a) and (b) )<br>- Regulation GN R1198, published on 18 December 2009 in terms of the National Water Act (Section 21 ( c ) and (i) – rehabilitation of wetlands)<br>- Regulations GN R1199, published on 18 December 2009 in terms of the National Water Act (Section 21 ( c ) and (i) )<br>- Regulations GN R665, published on 6 September 2013 in terms of the National Water Act (Amended GN 398 and 399 – Section 21 (e), (f), (h), (g), (j)) |
| Nature Conservation Ordinance (Ord 19 of 1974) | - Chapters 2, 3, 4 and 6: Nature reserves, miscellaneous conservation measures, protection of wild animals other than fish, protection of Flora. |
| Northern Cape Nature Conservation Act (Act 9 of 2009) | - Addresses protected species in the Northern Cape and the permit application process related thereto. |
| Occupational Health and Safety Act (Act 85 of 1993) and Regulations | - Section 8: General duties of employers to their employees.<br>- Section 9: General duties of employers and self-employed persons to persons other than their employees. |
| Road Traffic Act (Act 93 of 1997) and Regulations | - Entire Act. |
| Water Services Amendment Act (Act 30 of 2007) | - It serves to provide the right to basic water and sanitation to the citizens of South Africa (giving effect to section 27 of the Constitution). |
| National Land Transport Act, (Act 5 of 1998) | |
| Northern Cape Planning and Development Act (Act 7 of 1998) | - To control planning and development |
| Spatial Planning and Land Use Management (Act 16 of 2013 | - To provide a framework for spaitial planning and land use management in |

| | |
|---|---|
| (SPLUMA) and regulations | the Republic;<br>- To specify the relationship between the spatial planning and the land use management, amongst others<br>- Regulations GN R239 published on 23 March 2015 in terms of SPLUMA |
| Subdivision of Agricultural Land Act, 70 of 1970 and regulations | - Regulations GN R373 published on 9 March 1979 in terms of Subdivision of Agricultural Land |
| | |
| Basic Conditions of Employment Act (Act 3 of 1997) ) as amended | - To regulate employment aspects |
| Community Development (Act 3 of 1966) | - To promote community development |
| Development Facilitation (Act 67 of 1995) and regulations | - To provide for planning and development |
| Development Facilitation (GN24, PG329, 24/07/1998) | - Regulations re Northern Cape LDO's |
| Development Facilitation (GNR1, GG20775, 07/01/2000) | - Regulations re application rules S26, S46, S59 |
| Development Facilitation (GN732, GG14765, 30/04/2004) | - Determines amount, see S7(b)(ii) |
| Land Survey Act (Act 8 of 1997) ) and regulations, more specifically GN R1130 | - To control land surveying, beacons etc. and the like;<br>- Agriculture, land survey S10 |
| National Veld and Forest Fire Act (Act 101 of 1998) ) and regulations, more specifically GN R1775 | - To regulate law on veld and forest fires<br>- (Draft regulations s21) |
| | |
| Municipal Ordinance, 20/1974 | - To control pollution, sewers etc. |
| Municipal Ordinance, PN955, 29/08/1975 | - Nature conservation Regulations |
| Cape Land Use Planning Ordinance, 15/85 | - To control land use planning |
| Cape Land Use Planning Ordinance, PN1050, 05/12/1988 | - Land use planning Regulations |
| | |

**f) Need and desirability of the proposed activities:**

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

In terms of the Environmental Impact Assessment Regulations, 2014 (GG38282, Government Notice No. R. 982) the need and desirability of any development must be included in the relevant reports to be submitted to the competent authority.

Assessment of the geological information available has determined that the area in question may have various mineral targets. In order to ascertain the above and determine the nature, locality and extent of the mineral targets within the prospecting area, it will be necessary that prospecting be undertaken. The prospecting will also determine if there are any features that may have an impact on the economic extraction of the minerals.

The information that will be obtained from the prospecting to be done will be necessary to determine, should the minerals be found, how and where the minerals will be extracted and how much economically viable mineral reserves are available within the proposed prospecting area.

Should the minerals applied for be found in the application area, Xhariep will be able to ensure employment opportunities and support to the local business for a certain period of time.

Xhariep expects that substantial benefits from the project (should the minerals applied for be found) will accrue to the immediate project area, the sub-region and the Northern Cape Province. These benefits must be offset against the costs of the project, including the impact to the surface owner.

**g) Motivation for the overall preferred site, activities and technology alternative:**

- The property on which or location where it is proposed to undertake the activity:
  The Geological formation supports the possibility that the minerals applied for could be found within the application area.

- The operational aspects of the activity:
  Xhariep aims to minimize its impact on the natural environment as much as possible and as such has opted to only use drilling as an invasive prospecting method.

- The technology to be used in the activity:
  A percussion drill rig will be used during phases 3, 5 and 7 of the prospecting activities. There are no alternatives to these types of drill rigs that will ensure high quality samples for analysis.

## h) Full description of the process followed to reach the proposed preferred alternatives within the site:

(NB!! – This section is about the determination of the specific site layout and the location of infrastructure and activities on site, having taken into consideration the issues raised by interested and affected parties, and the consideration of alternatives to the initially proposed site layout.)

### (i) Details of all alternatives considered:

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

#### (a) The property on which or location where it is proposed to undertake the activity:

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

| Property description | District | Title Deed | Extent (Ha) |
|---|---|---|---|
| Farm Stofbakkies Public Outspan 30 | Prieska | T218/1995 | 1 415.8474 |

Alternatives considered:-
Xhariep has considered the following alternatives:

- The Geological formation that supports the possibility that the minerals applied for could be found within the area.
- The availability of farms within the area that is not already occupied by existing prospecting or mining rights.
- The availability of infrastructure, such as a road network, in the immediate surrounding area, which could be utilized to allow easy access to the site.

Taking the above into consideration, Xhariep opted to apply for the property as above.

#### (b) The type of activity to be undertaken:

Prospecting activities for Diamond (Alluvial, General, In Kimberlite) are to take place in the form of percussion/RC drilling.

Alternatives considered:-
The only alternative land use is farming activities; however the applicant's main economic activity is prospecting / mining and for this reason does not favour any other alternative land use.

#### (c) The design or layout of the activity:

Infrastructure: No offices and storerooms will be established at the site as Xhariep shall make use of facilities in the town of Kimberley / Prieska.

Invasive prospecting: The proposed locality of the exploration boreholes has been placed on a wide grid to determine the economic potential. The final locality of the exploration holes can only be determined after the desktop studies and geological mapping have been completed.

Alternatives considered:-
Infrastructure: The only alternative considered was the establishment of offices and storerooms on the farm under application. As Xhariep aims to minimize its

impact on the natural environment as much as possible this option was decided against.

Invasive prospecting: The drilling of boreholes over the entire property was considered, but taking into account that Xhariep aims to minimize its impact on the natural environment as much as possible this option was decided against.

**(d) The technology to be used in the activity:**

A percussion drill rig will be used during phase 3, whilst a reverse circulation drill rig will be used during phases 5 and 7 of the prospecting activities.

Alternatives considered:-
There are no alternatives to these types of drill rigs that will ensure high quality samples for analysis.

**(e) The operational aspects of the activity:**

Xhariep aims to minimize its impact on the natural environment as much as possible and as such has opted to only use drilling as an invasive prospecting method.

Alternatives considered:-
Xhariep considered conducting bulk sampling as part of its prospecting activities. To ensure the prospecting activities are cost effective, Xhariep opted to only conduct drilling activities during its initial prospecting period.

**(f) The option of not implementing the activity:**

Five measures of economic impacts can be used to demonstrate the potential effect of the proposed prospecting operation on the local economy:

- Employment - The extent of employment can be measured as number of jobs or in terms of full time equivalents.
- Payroll income - The gross remuneration of employees in terms of salaries and wages.
- Capital Expenditure (CAPEX) - The total amount spent on the purchasing of fixed assets and total spent on construction.
- Operating expenditure and maintenance (OPEX) - The total amount spent locally by businesses on goods and services, excluding salaries and wages as well as rents or interest.
- Revenue - The total value of sales arising from business activity at the prospecting operation.

The abovementioned positive impacts will be lost if the proposed prospecting project is not developed.

## (ii) Details of the Public Participation Process Followed:

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

The following interested and / or affected parties were identified:

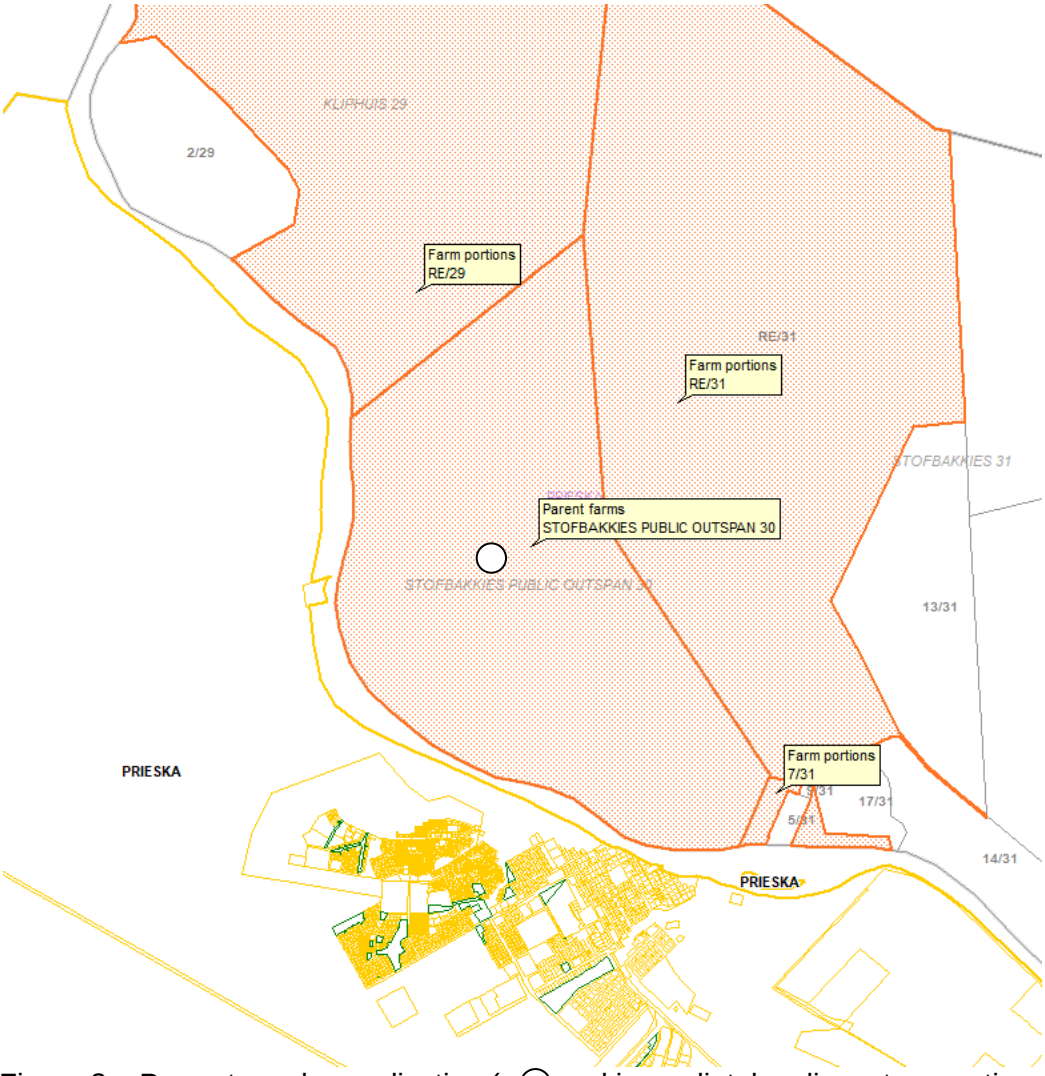



Figure 3 – Property under application ( ◯ and immediately adjacent properties

| Property description - Surface Owner | Owner |
|---|---|
| Farm Stofbakkies Public Outspan 30 | Mr. A.J. Theron |
| **Property description - Surrounding Owner** | |
| Remaining Extent of the Farm Kliphuis 29 | Mr. J.J. Botha |
| Remaining Extent of the Farm Stofbakkies 31 | Schalk Theron Familie Trust |
| Portion 7 of the Farm Stofbakkies 31 | Schalk Theron Familie Trust |

| Interested / Affected Party | Description |
|---|---|
| Siyathemba Local Municipality | Local Municipality |
| Mayor: Siyathemba Local Municipality | Mayor |
| Pixley Ka Seme District Municipality | District Municipality |
| | |
| Department: Agriculture, Environmental Affairs, Rural Development and Land Reform | Government Department |
| Department: Roads and Public Works | Government Department |
| Department: Water and Sanitation | Government Department |
| | |
| SAHRA | Administrative Body |
| | |
| Commission on Restitution of Land Rights | Government Department |
| | |

Notification (Refer to Appendix '5'):
Identified interested and/or affected parties were notified of the proposed activity as follows:

- Notification letters were sent to all identified interested and / or affected parties (either by registered mail or by e-mail) on the 17th of May 2023. Attached to each of these letters was a Background Information Document, containing information relating to the proposed project.
- A newspaper advert was placed in the 'Prieska Advertiser' local newspaper on the 23rd of May 2023.

Responses (Refer to Appendix '6'):
Responses have been received from the following IAPs. The responses are summarized in the table below.

- SAHRA

Meetings (Refer to Appendix '7'):
A meeting was held on the 5th of July 2023 with the surface owner. A draft Basic Assessment Report and Environmental Programme Report was provided to the surface owner.

Basic Assessment Report (Refer to Appendix '8'):
The Basic Assessment Report, inclusive of the required Heritage Impact Assessment and Palaeontological Impact Assessment, was re-circulated to all registered IAPs on the 23rd of August 2023.

### (iii) Summary of issues raised by I&AP's

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

| Interested and Affected Parties<br>List the names of persons consulted in this column, and mark with an X where those who must be consulted were in fact consulted. | | Date comments received | Issues raised | EAPs response to the issue of the I&AP |
|---|---|---|---|---|
| **AFFECTED PARTIES** | | | | |
| Landowner/s | X | | | |
| Mr. A.J. Theron | X | 05/07/2023 | A meeting was held on the 5th of July 2023 with the surface owner.<br><br>The following was discussed in this meeting:<br>• Proposed prospecting activities;<br>• Asbestos;<br>• Basic Assessment Report;<br>• Communication;<br>• Contractor;<br>• Depth of boreholes;<br>• Dust;<br>• Geologist;<br>• Guarantee;<br>• Irrigation lands;<br>• Minerals;<br>• Mining;<br>• Notice board;<br>• References;<br>• Specialist studies;<br>• Surface Use Agreement;<br>• Water; and<br>• Water Use License | Refer to Appendix '7' for the Minutes of the Meeting. |
| Lawful occupier/s of the land | | | | |
| The surface owner occupies the land. | | | | |

| | | | | |
|---|---|---|---|---|
| Landowners or lawful occupiers on adjacent properties | X | | | |
| Mr. J.J. Botha | X | N/A | No response has been received to date. | N/A |
| Schalk Theron Familie Trust | X | N/A | No response has been received to date. | N/A |
| Municipal Councillor | X | | | |
| Mayor: Mr. J.A. Phillips | X | N/A | No response has been received to date. | N/A |
| Municipality | X | | | |
| Siyathemba Local Municipality | X | N/A | No response has been received to date. | N/A |
| Pixley Ka Seme District Municipality | X | N/A | No response has been received to date. | N/A |
| Organs of State (Responsible for infrastructure that may be affected Roads Department, Eskom, Telkom, DWA, etc.) | | | | |
| Department: Roads and Public Works | X | N/A | No response has been received to date. | N/A |
| Department: Water and Sanitation | X | N/A | No response has been received to date. | N/A |
| Commission on Restitution of Land Rights | X | N/A | No response has been received to date. | N/A |
| Communities | | | | |
| There are no known communities within the immediate vicinity of the application area. | | | | |
| Department of Land Affairs | | | | |
| Department: Agriculture, Environmental Affairs, Rural Development and Land Reform | X | N/A | No response has been received to date. | N/A |
| Traditional Leaders | | | | |
| There are no known communities within the immediate vicinity of the application area. | | | | |
| Department of Environmental Affairs | | | | |
| Department: Agriculture, Environmental Affairs, Rural Development and Land Reform | X | N/A | No response has been received to date. | N/A |
| Other Competent Authorities | | | | |
| None identified | | | | |
| Other Interested and / or Affected Parties | | | | |
| SAHRA | X | 09/06/2023 | Ms. N. Higgitt of SAHRA provided an Interim Comment stating the following:<br>- The assessment must include an | Dr. Joseph Chikumbirike conducted a visit to the PR Area on 22 July 2023. |

| | | | | |
|---|---|---|---|---|
| | | | assessment of the impact to archaeological and palaeontological resources.<br>- The field-based assessment of archaeological resources must be conducted by a qualified archaeologist.<br>- A field-based Palaeontological Impact Assessment (PIA) must be undertaken by a qualified palaeontologist. | Dr. Chikumbirike provided a 'Desktop & Field Heritage Impact Assessment" (Appendix '9') and a 'Desktop & Field Palaeontological Impact Assessment' (Appendix '10'). The findings of these reports are included in the relevant sections of this BAR/EMPr. |
| | | 21/09/2023 | Ms. N. Higgitt provided a second Interim Comment requesting that the HIA be revised to provide a significance assessment for all identified sites and an impact assessment for the sites identified. | M&S provided SAHRA's Interim Comment to Dr. Chikumbirike to amend the HIA as requested. Dr. Chikumbirike made the changes to the HIA, which amended document was submitted to SAHRA for Final Comment on the 28th of September 2023. |

The consultation process was recorded until 29 September 2023.

Any consultation not received before the date of submission of the Final BAR/EMPr, and thus not included in this document, shall be provided to the DMRE as 'additional information' before granting of the PR Application.

## (iv) The Environmental attributes associated with the alternatives:

(The environmental attributed described must include socio-economic, social, heritage, cultural, geographical, physical and biological aspects.)

### (1) Baseline Environment:

#### (a) Type of environment affected by the proposed activity:

(its current geographical, physical, biological, socio-economic and cultural character.)

- **Air quality:**
  The following activities currently impact on the air quality of the region:
  - Nuisance dust created by vehicles travelling on the gravel (farm) roads transecting the immediate surrounding area.
  - Smoke from burning of harvest stubbles on the irrigation lands.
  - Nuisance dust created by tractors, combines and implements on the irrigation lands.

  The general air quality on the application area is expected to be good.

  The wind rose for Prieska shows how many hours per year the wind blows from the indicated direction.

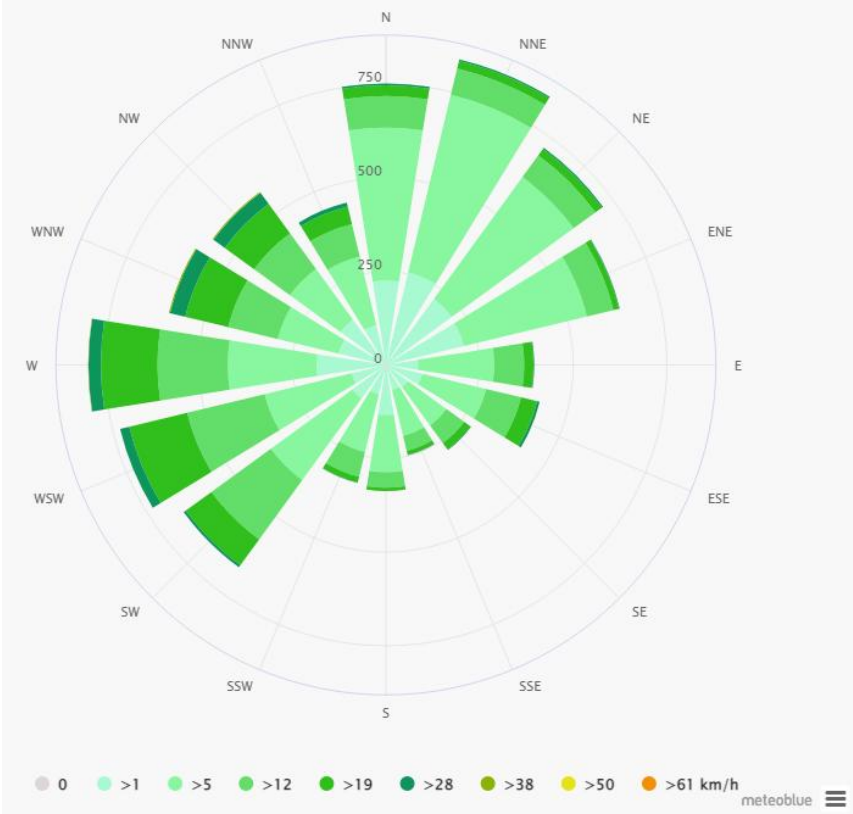



Figure 4 – Wind rose for Prieska area

The diagram for Prieska shows how many days within one month can be expected to reach certain wind speeds. Monsoons create steady strong winds from December to April, but calm winds from June to October.

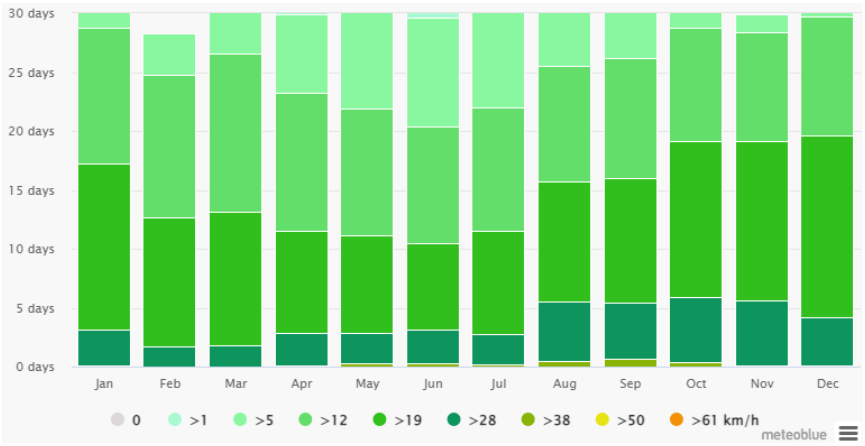



Figure 5 – Wind speed of the Prieska area

- **Archaeological, cultural & heritage environment:**
  Regulation 16(1)(v) of the Environmental Impact Assessment Regulations, 2014, as amended, requires that a proponent make use of the online 'National Environmental Screening Tool' to identify specific requirements, including specialist studies applicable to a proposed site based on the environmental sensitivity of the site.

  M&S made use of this Screening Tool to determine the Archaeological, Cultural Heritage and Palaeontology sensitivities of the PR Area. Refer to Appendix '10' for a copy of the Screening Report.

| Property / Development | Archaeological and Cultural Heritage | Palaeontology |
|---|---|---|
| Farm Stofbakkies Public Outspan 30 | Very High | Very High |

  Furthermore, the online Palaeosensitivity Map of South African Heritage Resources Agency (SAHRA) has been used to determine the palaeontological sensitivity of the application area. In terms of this map the sensitivity of the application area is rated as very high and requires a field assessment and protocol for finds.

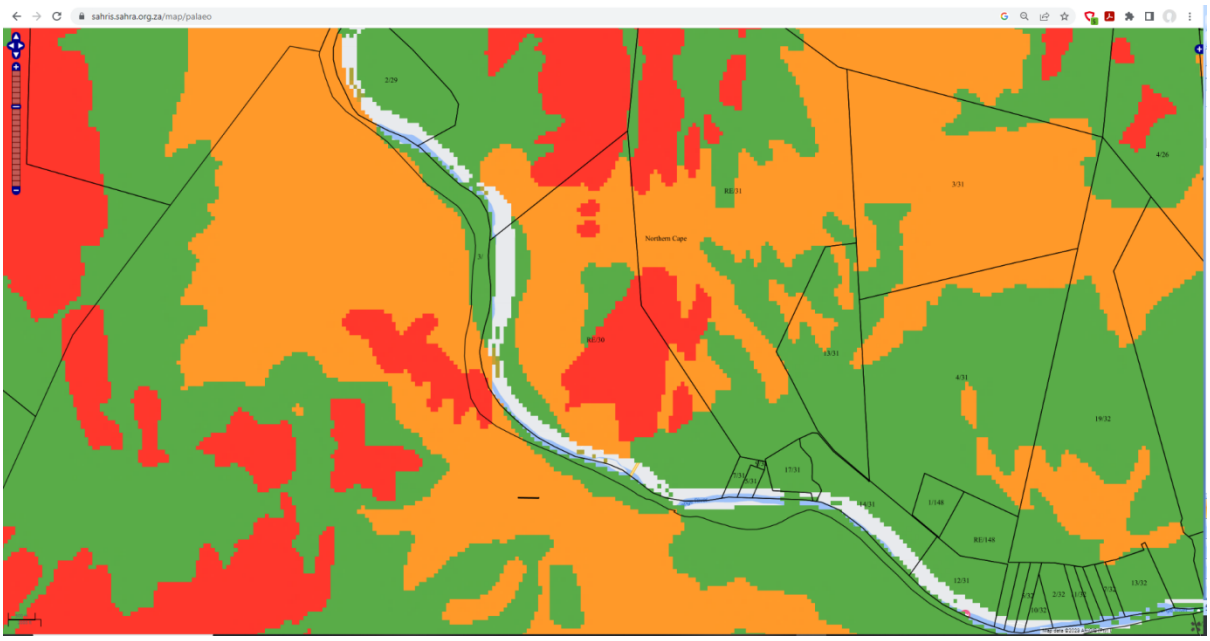



Figure 6 - Screengrab from online Palaeosensitivity Map showing prospecting right application area

**Fossil Sensitivity Map**

This map is available on the SAHRIS mapping system as a layer that can be switched on and off. The different colours on the map represent different levels of estimated palaeontological sensitivity.

| Colour | Sensitivity | Required Action |
|---|---|---|
| RED | VERY HIGH | field assessment and protocol for finds is required |
| ORANGE/YELLOW | HIGH | desktop study is required and based on the outcome of the desktop study, a field assessment is likely |
| GREEN | MODERATE | desktop study is required |
| BLUE | LOW | no palaeontological studies are required however a protocol for finds is required |
| GREY | INSIGNIFICANT/ZERO | no palaeontological studies are required |
| WHITE/CLEAR | UNKNOWN | these areas will require a minimum of a desktop study. As more information comes to light, SAHRA will continue to populate the map. |

Figure 7 - Legend of Palaeosensitivity Map

Pulafel 4D Consulting has been appointed to conduct a Heritage Impact Assessment and a Palaeontological Impact Assessment. The following is an abstract of the 'Conclusions and Recommendations' of these reports.

<u>Heritage Impact Assessment:</u>

"According to Beaumont et al (1995) "thousands of square kilometers of Bushmanland are covered by a low-density lithic scatter" and are referred to as background scatter (Orton 2016), generally of low heritage significance. Stone Age scatters and isolated finds of low heritage significance were recorded during HIA's in the area (e.g., Gaigher 2013, Fourie 2014, van der Walt 2015 and 2018) and similar, isolated finds that can be attributed to background scatter. These are characterized by a mantle of aeolean sand of top of a calcrete substrata and finds are mostly found where the calcrete protrudes through the sand cover. A substantion number of lithic materials were noted but artefacts are mostly dating to the MSA with faceted striking platforms. Graves were recorded in the prospecting area.

No adverse impact on heritage resources is expected by the project and it is recommended that the project can commence on the condition that the following recommendations are implemented as part of the EMPr and based on approval from SAHRA."

The 'Recommendations for condition of Authorisation' and 'Chance Find Procedure' are included under the management objectives on pages 61 – 63.

Palaeontological Impact Assessment:
"According to the SAHRA Paleontological sensitivity map the study are is of Moderate palaeontological significance. The study concluded that it is extremely unlikely that any fossils would be preserved in the Aeolian sands of the Gordonia Formation, Kalahari Group (Quaternary). There is a very small chance that fossils may have been trapped in features such as palaeo-pans or palaeo-springs, and buried by the Aeolian sands, but no such feature is visible in the satellite imagery. Nonetheless, a Fossil Chance Find Protocol should be added to the EMPr (Bamford 2022).

No adverse impact on heritage resources is expected by the project and it is recommended that the project commence on the condition that the following recommendations are implemented as part of the EMPr and based on approval from SAHRA."

The 'Recommendations for condition of Authorisation' and 'Chance Find Procedure' are included under the management objectives on page 65.

- **Climate:**
The Northern Cape experiences typical semi-desert and desert climatic conditions. The summers are hot and dry and the winters cold and frosty.

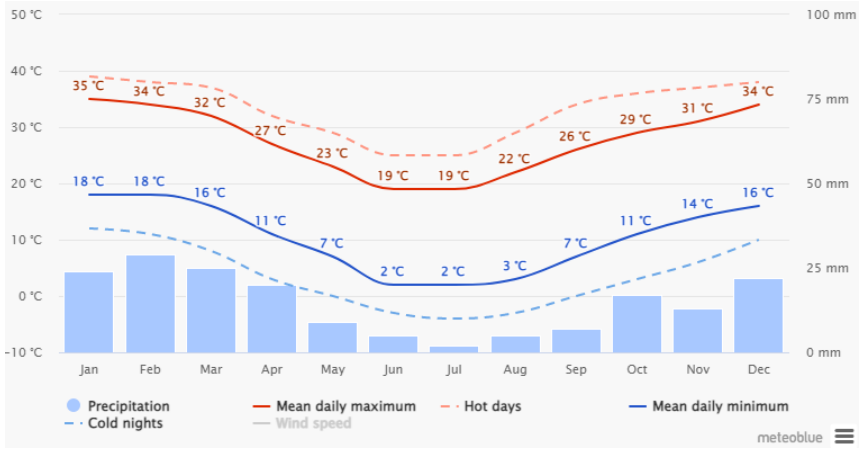


Figure 8 – Average temperatures and precipitation of the Prieska area

The "mean daily maximum" (solid red line) shows the maximum temperature of an average day for every month for Prieska.

Likewise, "mean daily minimum" (solid blue line) shows the average minimum temperature. Hot days and cold nights (dashed red and blue lines) show the average of the hottest day and coldest night of each month of the last 30 years.

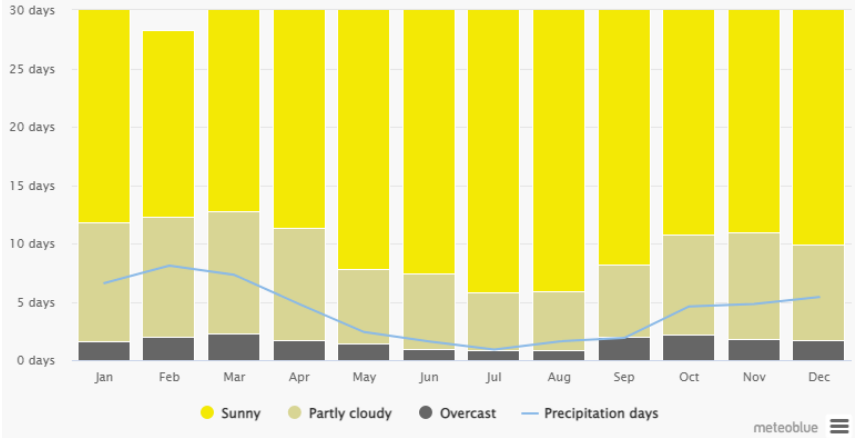



Figure 9 – Cloudy, sunny and precipitation days in the Prieska area

The graph shows the monthly number of sunny, partly cloudy, overcast and precipitation days. Days with less than 20% cloud cover are considered as sunny, with 20-80% cloud cover as partly cloudy and with more than 80% as overcast.

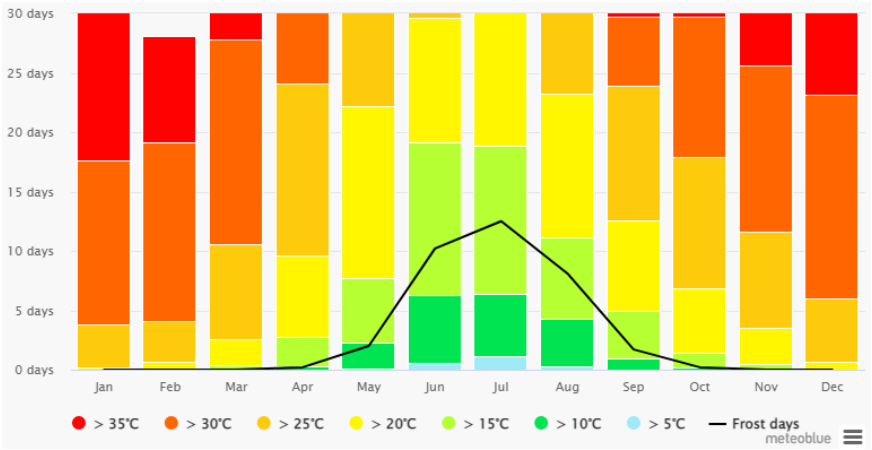



Figure 10 – Maximum temperatures in the Prieska area

The maximum temperature diagram for Prieska displays how many days per month reach certain temperatures.

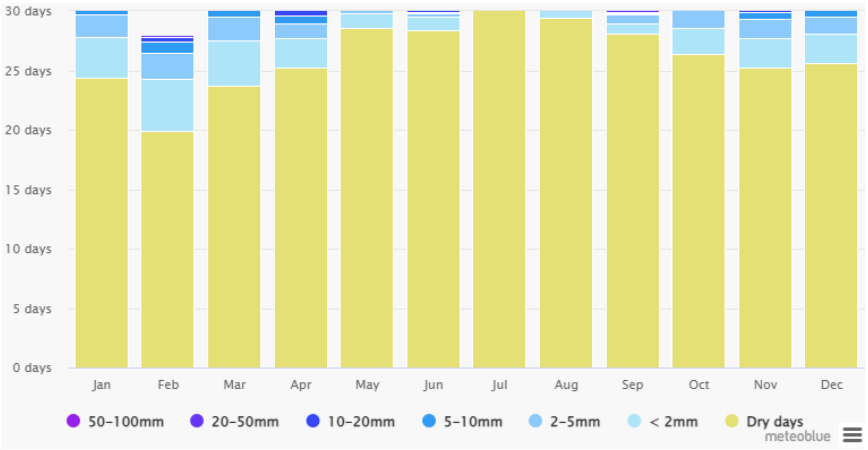



Figure 11 – Precipitation of the Prieska area

The precipitation diagram for Prieska shows on how many days per month, certain precipitation amounts are reached.

- **Fauna:**
  Animals likely to be found on the farm and surrounding environment include small mammals and birds that are associated with the Lower Gariep Broken Veld; Northern Upper Karoo and Upper Gariep Alluvial Vegetation Types.

- **Flora:**
  There are three broad vegetation types found within the area under application.

  Lower Gariep Broken Veld (NKb 1):
  Hills and low mountains, slightly irregular plains but with some rugged terrain with sparse vegetation dominated by shrubs and dwarf shrubs, with annuals conspicuous, especially in spring, and perennial grasses and herbs. Groups of widely scattered low trees such as *Aloe dichotoma* var. *dichotoma* and *Acacia mellifera* subsp. *detinens* occur on slopes of koppies and on sandy soils of foot slopes respectively.
  Conservation:
  → Least threatened.
  → Target 21%.
  → Statutorily conserved in Augrabies Falls National Park (4%).
  → Only a very small part transformed.
  → Erosion is low (58%), very low (27%) and moderate (14%).

  Northern Upper Karoo (NKu 3):
  Shrubland dominated by dwarf karoo shrubs, grasses and *Acacia mellifera* subsp. *detinens* and some other low trees (especially on sandy soils in the northern parts and vicinity of the Orange River). Flat to gently sloping, with isolated hills of Upper Karoo Hardeveld in the south and Vaalbos Rocky Shrubland in the northeast and with many interspersed pans.

  Conservation:
  → Least threatened.
  → Target 21%.

→ None conserved in statutory conservation areas.
→ About 4% has been cleared for cultivation or irreversibly transformed by building of dams.
→ Erosion is moderate (46.2%), very low (32%) and low (20%).
→ *Prosopis glandulosa*, regarded as one of the 12 agriculturally most important invasive alien plants in South Africa, is widely distributed in this vegetation type. *Prosopis* occurs in generally isolated patches, with densities ranging from very scattered to medium (associated with the lower Vaal River drainage system and the confluence with the Orange River) to localised closed woodland on the western border of the unit with Bushmanland Basin Shrubland.

<u>Upper Gariep Alluvial Vegetation (AZa 4):</u>
Flat alluvial terraces supporting complex of riparian thickets dominated by native *Acacia karroo* and *Dispyros lycioides*, flooded grasslands, reed beds and ephemeral herblands populating mainly sand banks within the river and on its banks.

Conservation:
→ Vulnerable.
→ Target 31%.
→ Only about 3% statutorily conserved in Tussen Die Riviere, Gariep Dam and Oviston Nature Reserves.
→ More than 20% transformed for cultivation and building of dams.
→ Exotic woody species such as *Salix babylonica*, *Eucalyptus camaldulensis*, *E. sideroxylon*, *Prosopis* and *Populus* species have become common dominants in patches of heavily disturbed alluvial vegetation.

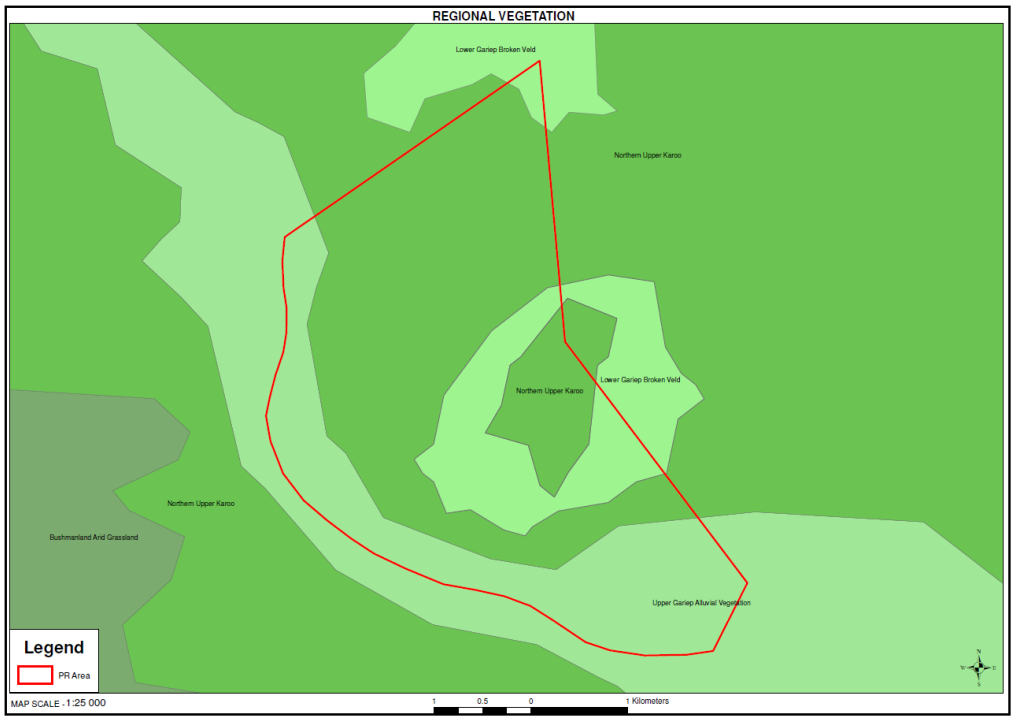


Figure 12 – Regional vegetation map

The total anticipated surface disturbance by Xhariep calculates to approximately 2 hectares. The total extent of the application area is 1 415.8474 hectares, thus calculating to a 0.14% surface disturbance by Xhariep. The anticipated impacts associated with the proposed prospecting operation are thus negligible and it is not foreseen that the economic livelihood of the surface owner from the farming activities will be irreversibly damaged.

- **Geology:**
  The 1:250,000 Geological Map 2922 describes the lithology as follows:
  Outcropping sedimentary rocks for the PR Area includes sand and sandy soils (Qs) as well as Calcrete (T-Qc).

  The PR Area falls near the western edge of the Kaapvaal Craton. The area is largely underlain by Vaalian-aged rocks belonging to the Griqualand West Supergroup. The Asbestos Hills Subgroup is represented by banded ironstone, lenses of haematite, brown jaspilite, crocidolite, riebeckitic jaspilite, chert (Vk). The Campbell Rand Subgroup is represented by coarse-to-fine-grained dolomite and limestone, interbedded chert (Vgd)

  Being located within the boundaries of the Kaapvaal Craton the PR Area has the potential for primary diamond deposits and its weathered products.

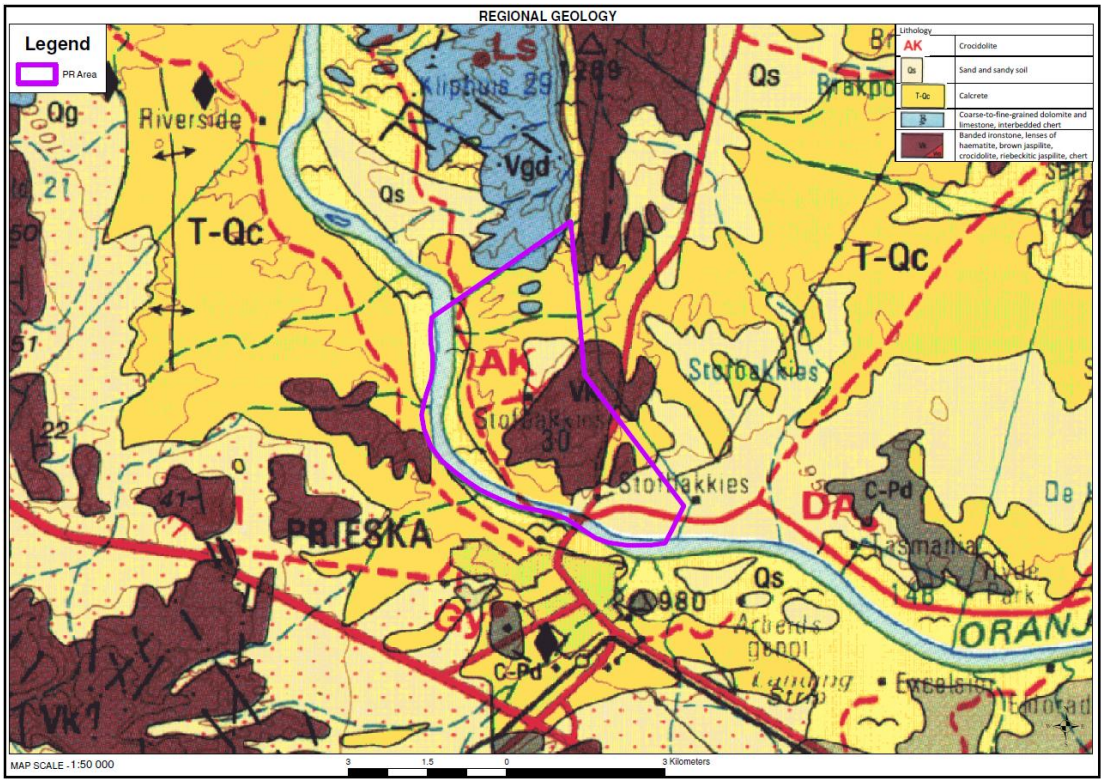


Figure 13 – Regional Geological map

- **Groundwater:**

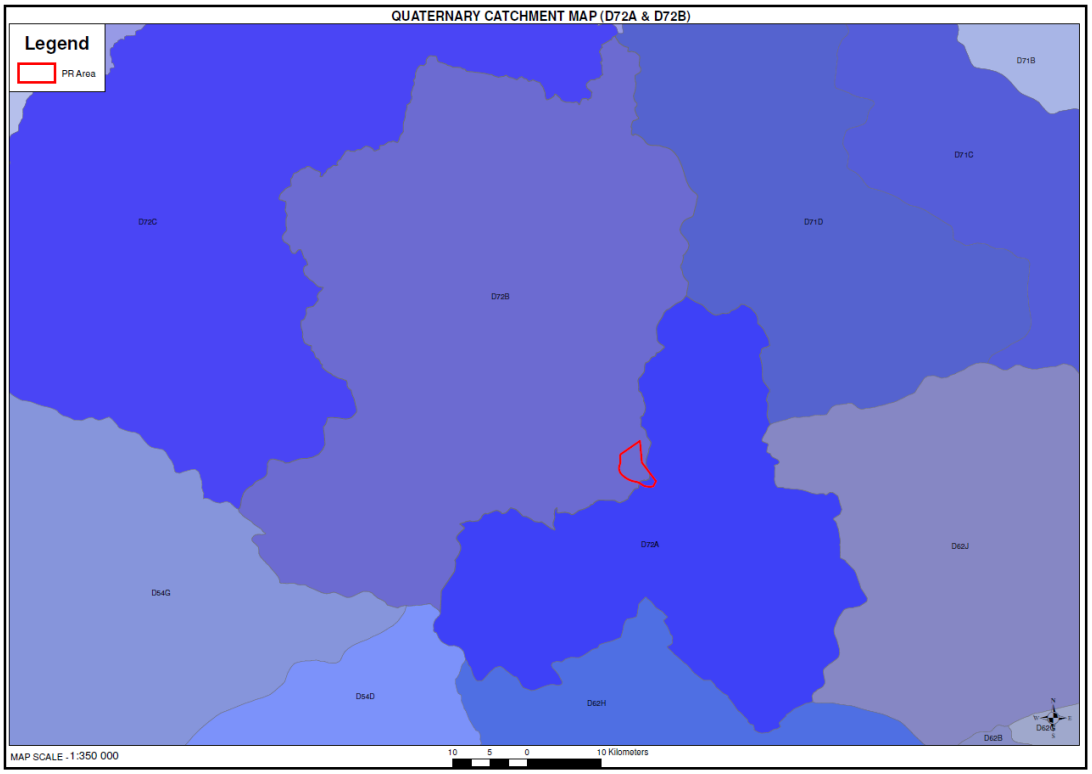


Figure 14 – Catchment map

The application area falls over the D72A and D72B quaternary drainage regions.
These drainage regions form part of the Orange Water Management Area (nr. 6) in terms of the National Water Act, 1998 (Act no. 36 of 1998) as published in the Government Gazette 1056, 16 September 2016).

The ground water quality is expected to be reasonable.

- **Noise:**
Current sources of noise in the immediately surrounding area are from vehicles travelling on the secondary roads and the gravel (farm) roads transecting the property and immediate surrounding area as well as noise from farming equipment.

- **Sensitive landscapes:**
"Sensitive environments" that have statutory protection are the following:
  - Limited development areas (section 23 of the Environment Conservation Act, 1989 (Act 73 of 1989).
  - Protected natural environments and national heritage sites.
  - National, provincial, municipal and private nature reserves.
  - Conservation areas and sites of conservation significance.
  - National monuments and gardens of remembrance.
  - Archaeological and palaeontological sites.
  - Graves and burial sites
  - Lake areas, offshore islands and the admiralty reserve.

- Estuaries, lagoons, wetlands and lakes.
- Streams and river channels, and their banks.
- Dunes and beaches.
- Caves and sites of geological significance.
- Battle and burial sites.
- Habitat and /or breeding sites of Red Data Book species.
- Areas or sites of outstanding natural beauty.
- Areas or sites of special scientific interest.
- Areas or sites of special social, cultural or historical interest.
- Declared national heritage sites
- Mountain catchment areas.
- Areas with eco-tourism potential

The following sensitive environments have been identified within the PR Area:

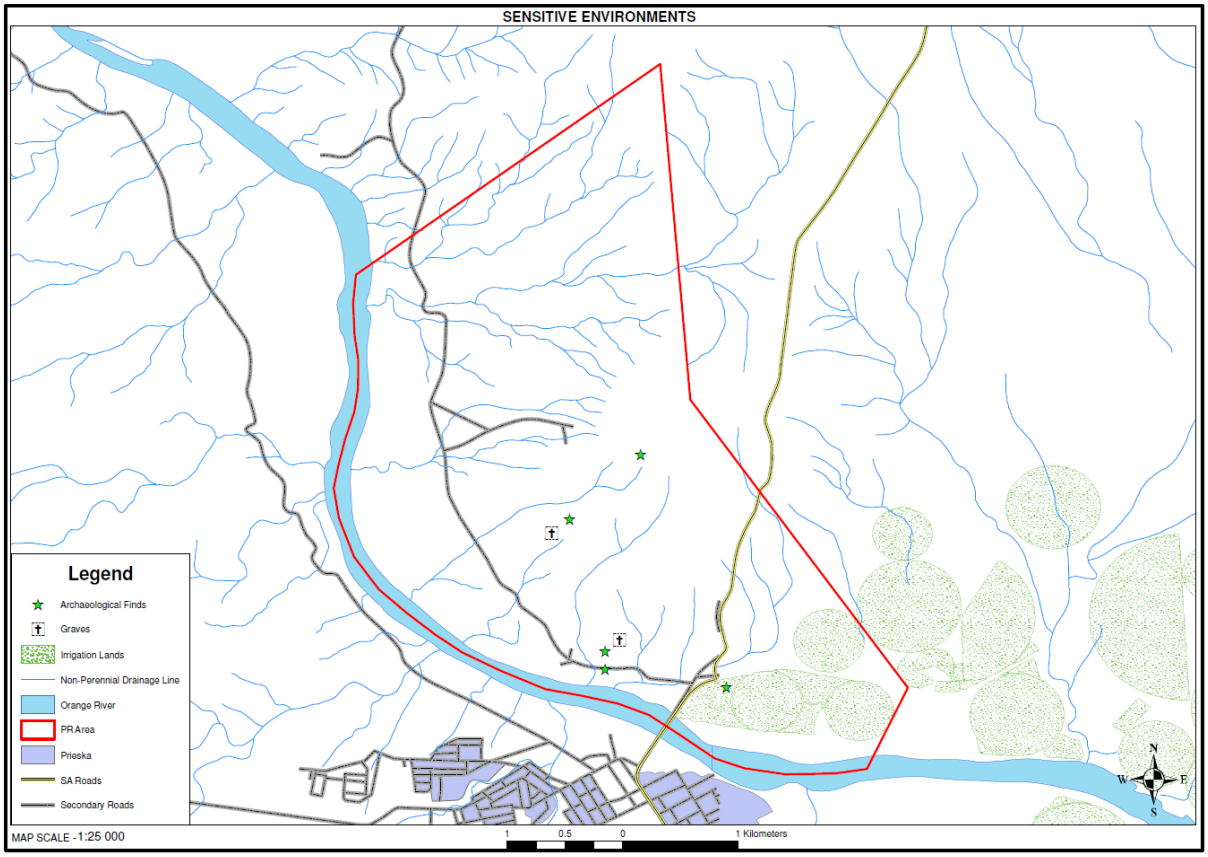



Figure 15 - Sensitive landscapes

→ Archaeological and palaeontological sites:

| Type / Description | Mitigation / Action |
|---|---|
| Old building / foundations with bended stone | Avoid |
| Settlement: Old Farmhouse | Avoid |
| Gravesite 1: With collapsed fencing | Avoid / Buffer |
| Quarrying site / man-made rock damming | Avoid |
| Gravesite 2: ±22 Stone marked graves / midway between the settlement and the | Avoid / Buffer |

| | |
|---|---|
| old mining site | |
| Old mine site – Open quarries / Tailings / Loadings structure / abandoned machinery | Avoid |
| Shooting practice contemporary use | Avoid / Relocate |

All identified archaeological and palaeontological finds are described in detail in the HIA and PIA attached to this BAR/EMPr.

→ Streams and river channels, and their banks:
There are a number of non-perennial drainage lines within the application area. The Orange River forms the southern boundary of the PR Area.

- **Socio-Economic:**
Censuses were held in 2001, 2011 and 2022, whilst Community Surveys were held in 2007 and 2016 respectively.

The last census was held in 2022; however these results are not yet available. The following section was compiled using data from Census 2001 and 2011.

The PR Area fall within the Siyathemba Local Municipality, which fall under the management of the Pixley Ka Seme District Municipality.

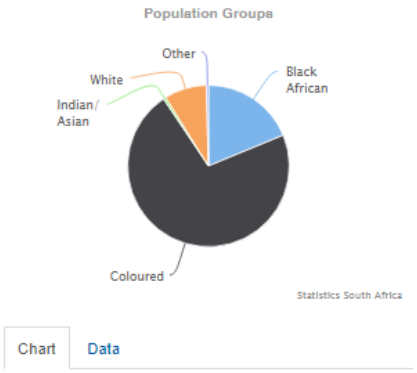
| Key Statistics | 2001 |
|---|---|
| Total population | 18,445 |
| Young (0-14) | 33,7% |
| Working Age (15-64) | 63,2% |
| Elderly (65+) | 5,9% |
| Dependency ratio | 65,5% |
| Sex ratio | 89,9 |
| Growth rate | -1,77% (2001-2011) |
| Unemployment rate | 36% |
| Youth unemployment rate | 43,1% |
| No schooling aged 20+ | 21,8% |
| Higher education aged 20+ | 4,7% |
| Matric aged 20+ | 12,1% |
| Number of households | 4,455 |
| Average household size | 4 |
| Female headed households | 33,6% |
| Formal dwellings | 88,9% |
| Housing owned/paying off | 54,8% |
| Flush toilet connected to sewerage | 65,9% |
| Weekly refuse removal | 75,8% |
| Piped water inside dwelling | 22,5% |
| Electricity for lighting | 80,9% |

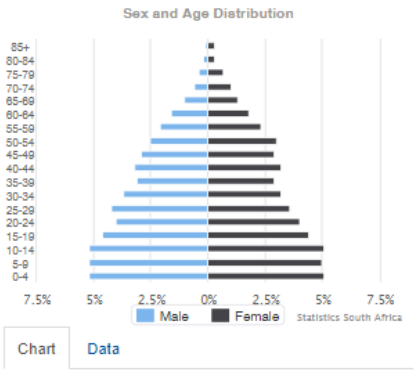
| Key Statistics | 2011 |
|---|---|
| Total population | 21,591 |
| Young (0-14) | 30,8% |
| Working Age (15-64) | 63,2% |
| Elderly (65+) | 6% |
| Dependency ratio | 58,2 |
| Sex ratio | 99,3 |
| Growth rate | 1,57% (2001-2011) |
| Population density | 1 persons/km2 |
| Unemployment rate | 24,3% |
| Youth unemployment rate | 30,2% |
| No schooling aged 20+ | 11,5% |
| Higher education aged 20+ | 5,3% |
| Matric aged 20+ | 18% |
| Number of households | 5,831 |
| Number of Agricultural households | 1,334 |
| Average household size | 3,6 |
| Female headed households | 36,1% |
| Formal dwellings | 88,6% |
| Housing owned/paying off | 54,3% |
| Flush toilet connected to sewerage | 64,9% |
| Weekly refuse removal | 73,9% |
| Piped water inside dwelling | 43,1% |
| Electricity for lighting | 86,2% |

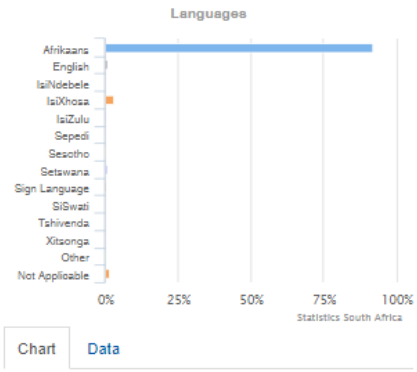
People:

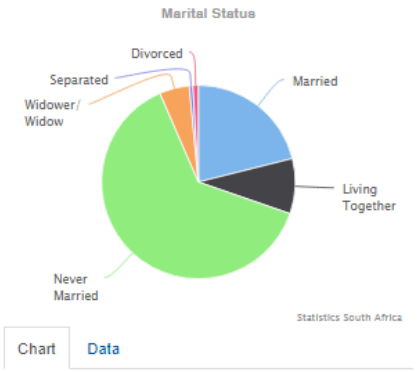
The total population in the municipality is 21 591 people with Xhosa and Afrikaans being the dominant languages. The most dominant population group is coloured people; they represent 80% of the total population in the municipal area. The other groups are black African (12%) and white people (8%).

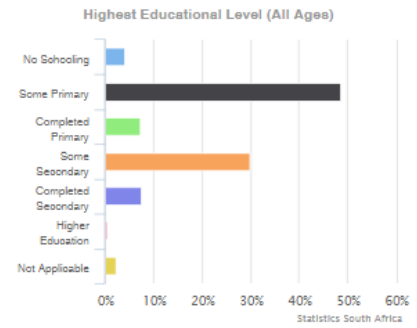
Afrikaans is the most widely spoken language (78%). There are an insignificant number of people who speak other languages. A total of 824 people indicated that IsiNdebele is their first language and 91 people speak Setswana.

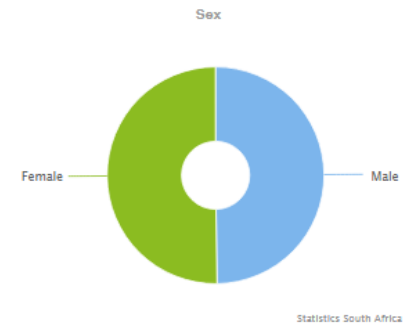


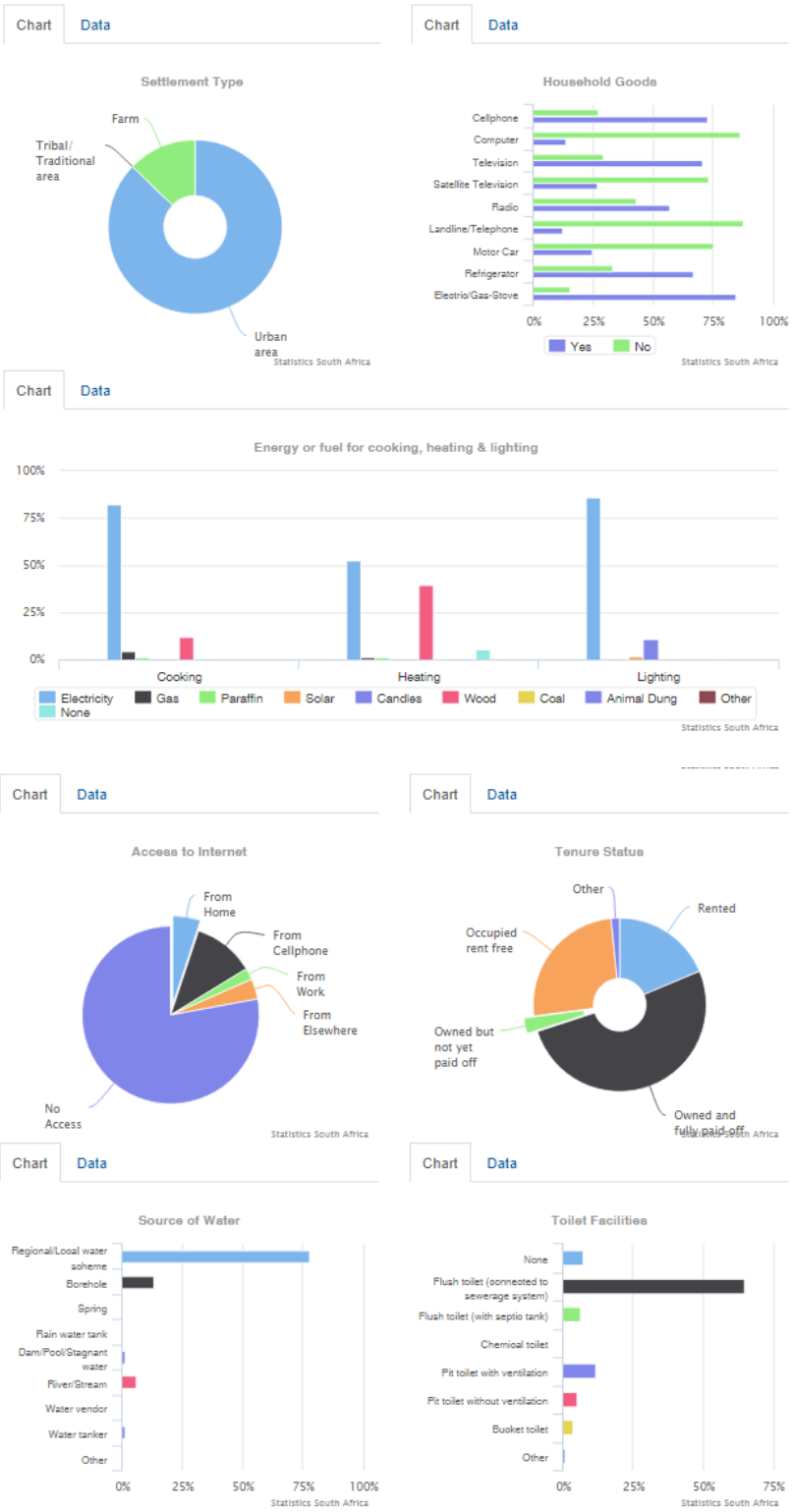

Living conditions:

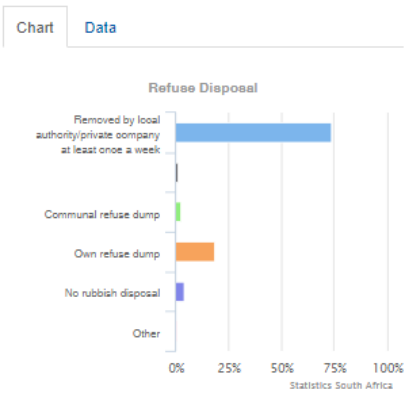
The educational profile in Siyathemba is that of 14% of the population had no schooling, while 34% had primary school education. Just 4% of the population has a degree or diploma.

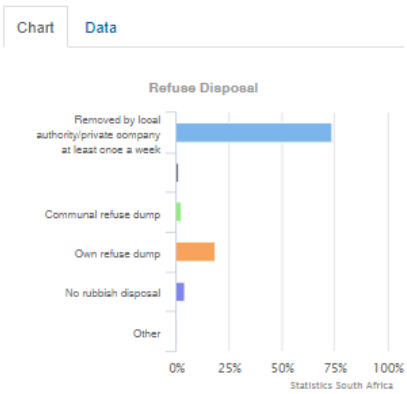
According to the 2011 census results:

- 71.29% of people are using flush toilet.
- 74.88% access to refuse removal

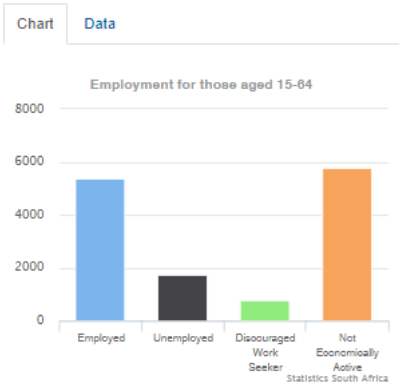
- 97.46 % of people have access to piped water.

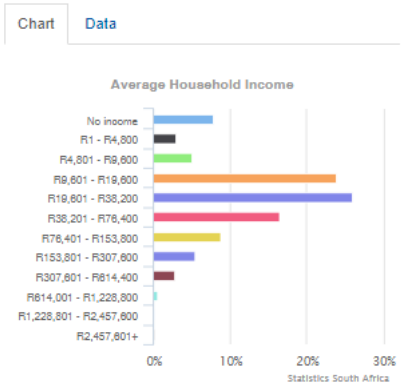





<u>Economy:</u>
The whole of the Siyathemba area is rich in semiprecious stones. The famed 'tiger's eye' is one of many gems mined in the region. An opportunity exists for adding value to the raw material and shipping out processed products of high quality.




- **Soil:**
  The soils of the application area are described per vegetation type:

  Lower Gariep Broken Veld: The soils are shallow and skeletal (dominant soil forms are Mispah and Glenrosa), typical mainly of Ib and Ic land types, and to a lesser extent also of Fb land type.

  Northern Upper Karoo: Soils are variable from shallow to deep, red-yellow, apedal, freely drained soils to very shallow Glenrosa and Mispah forms. Mainly Ae, Ag and Fc land types.

  Upper Gariep Alluvial Vegetation: Recent alluvial deposits underlain mostly by Karoo Supergroup sediments and tillites, supporting soils typical of Ia group land types. Subject to flooding, especially in summer.

- **Surface water:**

  There are a number of non-perennial drainage lines within the application area. The Orange River forms the southern boundary of the PR Area.

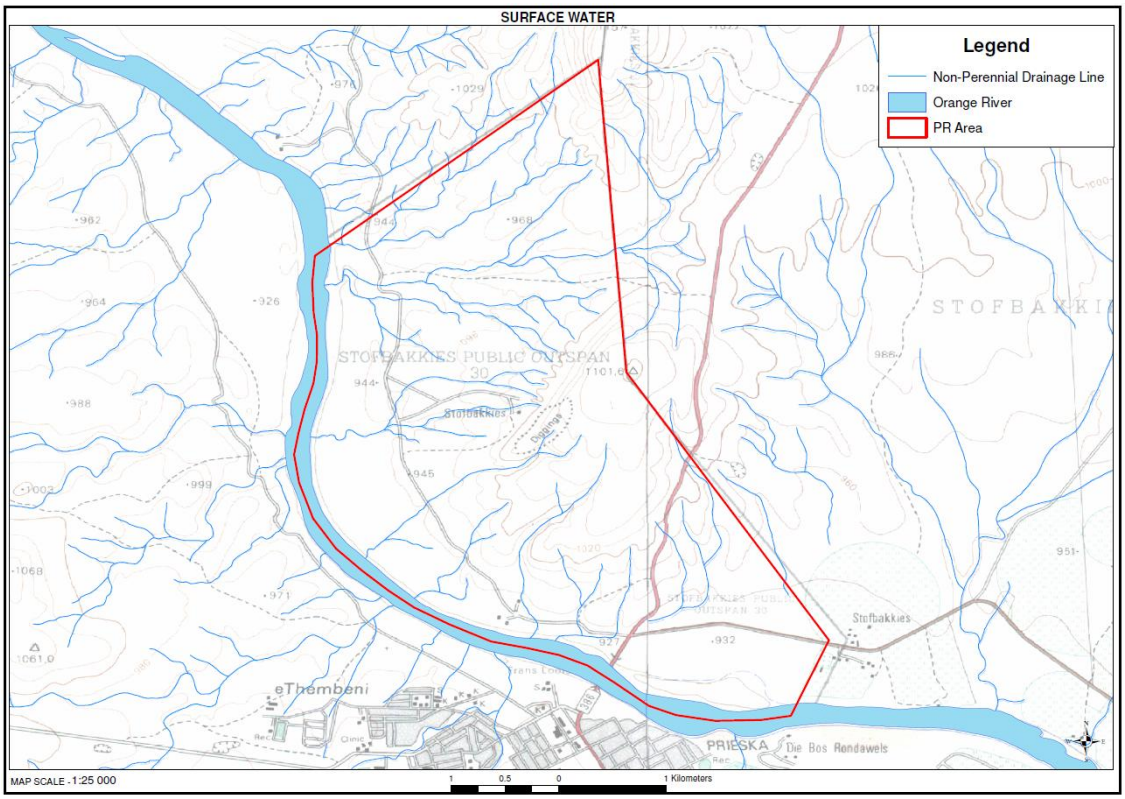



Figure 16 – Surface water map

**(b) Description of the current land uses.**

The surface owner currently utilizes the PR Area for farming purposes (including irrigation).

**(c) Description of specific environmental features and infrastructure on the site.**

- Infrastructure:
  - The on-site gravel (farm) roads are in a reasonable condition.
  - The secondary gravel roads accessing the farm are in a reasonable condition.
  - There are only a few windmills and relating agricultural infrastructure within the area under application.

- Environmental:
  There are a number of non-perennial drainage lines within the application area. The Orange River forms the southern boundary of the PR Area.

- Archaeological / Palaeontological:
  - Old building / foundations with bended stone
  - Settlement: old farmhouse
  - Gravesite 1: with collapsed fencing
  - Quarrying site / man-made rock damming
  - Gravesite 2: ±22 Stone marked graves / midway between the settlement and the old mining site
  - Old mine site: Open quarries / tailings / loadings structure / abandoned machinery
  - Shooting practice: contemporary use

## (d) Environmental and current land use map:

(Show all environmental and current land use features.)

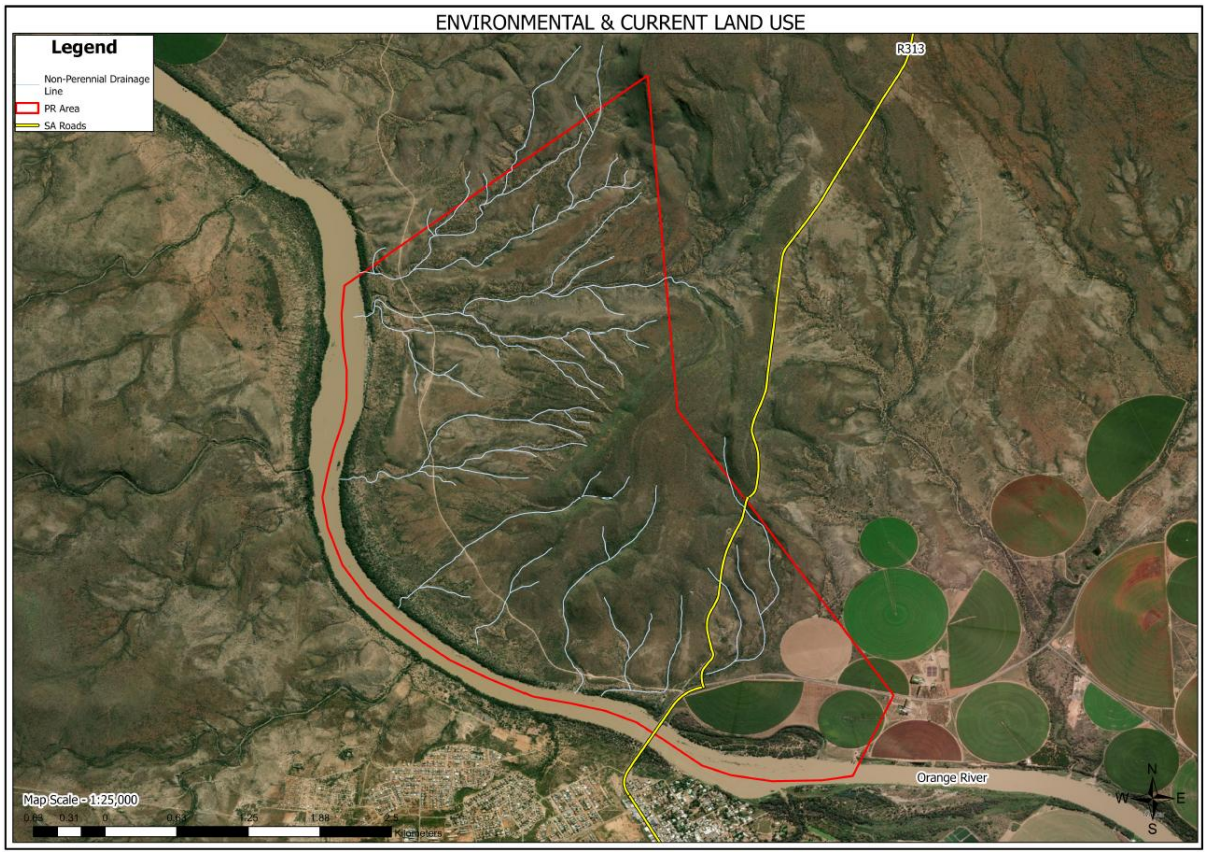



Figure 17 – Current land use and environmental map

**(v) Impacts identified:**

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

Cumulative environmental impacts can be defined as changes to the environment caused by the combined impact of past, present and future human activities and/or natural processes.

Farming:

The property under application for a Prospecting Right is currently used for farming activities (including irrigation / livestock grazing). The property is divided into a number of 'camps' and the livestock are rotated between the camps. This provides rest periods for plants while others are being grazed. Impacts associated with livestock farming activities include overgrazing, destruction of the natural vegetation cover and soil compaction through 'trampling' if the rotational grazing method is not implemented correctly by the surface owner and loss of surface/groundwater if water related infrastructure; i.e. pipelines, dams and troughs, are not adequately maintained. Impacts associated with irrigation include smoke from burning of harvest stubbles; nuisance dust created by tractors, combines and implements; destruction of natural vegetation cover where irrigation lands are established; fertilizers used for the irrigation activities could cause nitrate pollution in groundwater resources / Orange River and soil pollution (from fertilizers).

Prospecting:

The only invasive prospecting activity that will be conducted by Xhariep is drilling. Provision has been made for forty boreholes (20 boreholes during first phase drilling and 20 boreholes during follow-up drilling phases).

The site clearance for drill rigs will be kept to a minimum and provision is made for a 20m x 20m surface disturbance around each borehole. Existing roads and farm tracks shall be used as far as possible. Provision is made for 100m x 3m wide two-spoor access tracks for the drilling rig.

The total anticipated surface disturbance by Xhariep calculates to approximately 1.6ha for the proposed boreholes and approximately 0.15ha for the anticipated two-spoor access tracks. The total extent of the application area is 1 415.8474 hectares, thus calculating to a 0.14% surface disturbance by Xhariep. The anticipated impacts associated with the proposed prospecting operation are thus negligible and it is not foreseen that the economic livelihood of the surface owner from the livestock farming / irrigation activities will be negatively affected.

- **Air Quality:**

| Activity | Extent | Duration | Intensity | Probability | Significance without mitigation |
|---|---|---|---|---|---|
| Drilling | Site | Short Term | Low | Definite | Low |
| Nuisance dust – roads | Site | Short Term | Low | Definite | Low |
| Nuisance dust – vegetation clearance | Local | Long Term | Low | Definite | Low |
| Nuisance dust – irrigation activities | Site | Short Term | Low | Definite | Low |
| Smoke – domestic fires | Site | Short Term | Low | Improbable | No significance |
| Smoke – burning of harvest stubbles | Regional | Short Term | Low | Definite | Low |
| Vehicle emissions | Local | Short Term | Low | Probable | No significance |

| Activity | Impact summary | Significance with mitigation |
|---|---|---|
| Air Quality | *Direct impacts – Prospecting Activities:*<br>• Nuisance dust created by drilling.<br>• Nuisance dust created on roads from vehicles and equipment utilized by the prospecting operation.<br>• Vehicle emissions from vehicles and equipment utilized by the prospecting operation. | Negative:<br>Very Low |
| | *Direct impacts – Farming Activities:*<br>• Smoke from burning of harvest stubbles on irrigation lands.<br>• Nuisance dust created by tractors, combines and implements on irrigation lands.<br>• Nuisance dust from the farm roads and road network in the surrounding area.<br>• Vehicle emissions from vehicles utilized by farming activities.<br>• Smoke from domestic fires. | Negative:<br>Very Low |
| | *Indirect impacts:*<br>• Nuisance dust created in areas where vegetation cover is cleared for drilling sites. | Negative:<br>Very Low |
| | *Cumulative impacts:*<br>• Nuisance dust created by drilling.<br>• Nuisance dust created on roads from vehicles and equipment utilized by the prospecting operation.<br>• Vehicle emissions from vehicles and equipment utilized by the prospecting operation. | Negative<br>Very Low |

| Activity | Impact summary | Significance with mitigation |
|---|---|---|
| | • Nuisance dust created in areas where vegetation cover is cleared for drilling sites.<br>• Smoke from burning of harvest stubbles on irrigation lands.<br>• Nuisance dust created by tractors, combines and implements on irrigation lands.<br>• Nuisance dust from the farm roads and road network in the surrounding area.<br>• Vehicle emissions from vehicles utilized by farming activities.<br>• Smoke from domestic fires. | |

- **Fauna:**

| Activity | Extent | Duration | Intensity | Probability | Significance without mitigation |
|---|---|---|---|---|---|
| Disturbance of natural habitat – Drill sites | Local | Long Term | Medium | Probable | Medium |
| Disturbance of natural habitat – Farming Activities | Local | Long Term | Medium | Improbable | Medium |

| Activity | Impact summary | Significance with mitigation |
|---|---|---|
| Fauna | *Direct impacts – Prospecting Activities:*<br>• Disturbance of natural habitat of fauna when vegetation is cleared for drilling sites. | Negative: Low |
| | *Direct impacts – Farming Activities:*<br>• Disturbance of natural habitat of fauna when irrigation lands are established.<br>• Disturbance of natural habitat of fauna in the instance of overgrazing. | Negative: Low |
| | *Indirect impacts:*<br>• Potential road kills. | No significance |
| | *Cumulative impacts:*<br>• Disturbance of natural habitat of fauna when vegetation is cleared for drilling sites.<br>• Disturbance of natural habitat of fauna when irrigation lands are established.<br>• Disturbance of natural habitat of fauna in the instance of overgrazing.<br>• Potential road kills. | Negative: Low |

- **Flora:**

| Activity | Extent | Duration | Intensity | Probability | Significance without mitigation |
|---|---|---|---|---|---|
| Disturbance of natural vegetation cover – Drill sites | Local | Long Term | Medium | Definite | Medium |
| Disturbance of natural vegetation cover – Farming Activities | Local | Long Term | Medium | Probable | Medium |
| Veld fires | Regional | Medium Term | High | Probable | High |

| Activity | Impact summary | Significance with mitigation |
|---|---|---|
| Flora | *Direct impacts – Prospecting Activities:*<br>• Disturbance and/or destruction of natural vegetation cover when vegetation is cleared for drilling sites. | Negative: Low |
| | *Direct impacts – Prospecting Activities:*<br>• Disturbance and/or destruction of natural vegetation cover when vegetation is cleared for irrigation lands.<br>• Disturbance and/or destruction of natural vegetation cover in the instance of overgrazing. | Negative: Low |
| | *Indirect impacts:*<br>• Disturbance of natural habitat of fauna when vegetation is cleared for drilling sites.<br>• Disturbance of natural habitat of fauna when irrigation lands are established.<br>• Disturbance of natural habitat of fauna in the instance of overgrazing.<br>• Veld fires. | Negative: Low |
| | *Cumulative impacts:*<br>• Disturbance and/or destruction of natural vegetation cover when vegetation is cleared for drilling sites.<br>• Disturbance and/or destruction of natural vegetation cover when vegetation is cleared for irrigation lands.<br>• Disturbance and/or destruction of natural vegetation cover in the instance of overgrazing.<br>• Disturbance of natural habitat of fauna when vegetation is cleared for drilling sites.<br>• Disturbance of natural habitat of fauna when irrigation lands are established.<br>• Disturbance of natural habitat of fauna in the instance of overgrazing.<br>• Veld fires. | Negative: Low |

- **Groundwater:**

| Activity | Extent | Duration | Intensity | Probability | Significance without mitigation |
|---|---|---|---|---|---|
| Groundwater loss – Prospecting Activities | Site | Medium Term | Medium | Improbable | Low |
| Groundwater loss – Farming Activities | Site | Short Term | Medium | Improbable | Low |
| Groundwater contamination – Prospecting Activities | Site | Medium Term | Low | Probable | Low |
| Groundwater contamination – Farming Activities | Regional | Medium Term | Medium | Probable | Medium |

| Activity | Impact summary | Significance with mitigation |
|---|---|---|
| Groundwater | *Direct impacts – Prospecting Activities:*<br>• Utilization of groundwater for drilling could cause a drop in the groundwater table. | Negative: Very Low |
| | *Direct impacts – Farming Activities:*<br>• Loss of groundwater if water related infrastructure; i.e. pipelines, dams and troughs, are not adequately maintained by the surface owner.<br>• Fertilizers utilized for the irrigation activities could cause nitrate pollution. | Negative: Very Low |
| | *Indirect impacts:*<br>• Possible hydrocarbon spills from prospecting vehicles and equipment at the drilling sites, which could contaminate the groundwater.<br>• Possible chemical spills from chemical toilets utilized by the prospecting operation, which could contaminate the groundwater.<br>• Possible hydrocarbon spills from farming vehicles and equipment which could contaminate the groundwater. | Negative: Very Low |
| | *Cumulative impacts:*<br>• Utilization of groundwater for drilling could cause a drop in the groundwater table.<br>• Loss of groundwater if water related infrastructure; i.e. pipelines, dams and troughs, are not adequately maintained by the surface owner.<br>• Fertilizers utilized for the irrigation activities could cause nitrate pollution.<br>• Possible hydrocarbon spills from prospecting vehicles and equipment at the drilling sites, | Negative: Very Low |

| | | |
|---|---|---|
| | which could contaminate the groundwater.<br>• Possible chemical spills from chemical toilets utilized by the prospecting operation, which could contaminate the groundwater.<br>• Possible hydrocarbon spills from farming vehicles and equipment which could contaminate the groundwater. | |

- **Noise:**

| Activity | Extent | Duration | Intensity | Probability | Significance without mitigation |
|---|---|---|---|---|---|
| Drill rigs | Site | Short Term | Low | Definite | Low |
| Prospecting vehicles and equipment | Site | Short Term | Low | Probable | No significance |
| Farming vehicles and equipment | Site | Short Term | Low | Probable | No significance |

| Activity | Impact summary | Significance with mitigation |
|---|---|---|
| Noise | *Direct impacts – Prospecting Activities:*<br>• Noise from drilling rigs.<br>• Noise from prospecting vehicles and equipment. | Negative: Very Low |
| | *Direct impacts – Farming Activities:*<br>• Noise from farming vehicles, tractors and combines. | No significance |
| | *Indirect impacts:*<br>• None | N/A |
| | *Cumulative impacts:*<br>• Noise from drilling rigs.<br>• Noise from prospecting vehicles and equipment.<br>• Noise from farming vehicles, tractors and combines. | Negative: Very Low |

- **Soil:**

| Activity | Extent | Duration | Intensity | Probability | Significance without mitigation |
|---|---|---|---|---|---|
| Disturbance of soil structure | Local | Short Term | Low | Probable | Low |
| Hydrocarbon spills | Local | Short Term | Low | Probable | Low |
| Erosion | Site | Short Term | Low | Improbable | No significance |
| Soil compaction – Drilling | Local | Short Term | Low | Probable | Low |
| Soil compaction – Overgrazing | Local | Short Term | Low | Improbable | No significance |
| Spills from chemical toilet | Local | Short Term | Low | Improbable | No significance |

| Activity | Impact summary | Significance with mitigation |
|---|---|---|
| Soil | *Direct impacts- Prospecting Activities:*<br>• Disturbance of the soil structure during drilling activities.<br>• Possible hydrocarbon spills from prospecting vehicles and equipment at the drilling sites.<br>• Erosion in areas where vegetation has been cleared at the drilling sites.<br>• Possible chemical spills from chemical toilets utilized by the prospecting operation. | Negative: Very Low |
| | *Direct impacts- Farming Activities:*<br>• Disturbance of the soil structure where irrigation lands are established.<br>• Possible hydrocarbon spills from farming vehicles and equipment.<br>• Erosion in areas immediately surrounding the irrigation lands.<br>• Fertilizers utilized for the irrigation activities could cause nitrate pollution. | Negative: Very Low |
| | *Indirect impacts:*<br>• Compaction of soil during drilling activities.<br>• Compaction of soil in the event of overgrazing. | Negative: Very Low |
| | *Cumulative impacts:*<br>• Disturbance of the soil structure during drilling activities.<br>• Possible hydrocarbon spills from prospecting vehicles and equipment at the drilling sites.<br>• Erosion in areas where vegetation has been cleared at the drilling sites.<br>• Possible chemical spills from chemical toilets utilized by the prospecting operation.<br>• Disturbance of the soil structure where irrigation lands are established.<br>• Possible hydrocarbon spills from farming vehicles and equipment. | Negative: Very Low |

| | | |
|---|---|---|
| | • Erosion in areas immediately surrounding the irrigation lands.<br>• Fertilizers utilized for the irrigation activities could cause nitrate pollution.<br>• Compaction of soil during drilling activities.<br>• Compaction of soil in the event of overgrazing. | |

- **Surface water:**

| Activity | Extent | Duration | Intensity | Probability | Significance without mitigation |
|---|---|---|---|---|---|
| Utilization of surface water – Prospecting Activities | Regional | Short Term | Low | Definite | Low |
| Hydrocarbon spills | Site | Short Term | Low | Improbable | No significance |
| Utilization of surface water – Irrigation Activities | Regional | Long Term | Medium | Definite | Medium |
| Contamination of surface water – Irrigation Activities | Regional | Medium Term | Medium | Probable | Medium |

| Activity | Impact summary | Significance with mitigation |
|---|---|---|
| Surface Water | *Direct impacts – Prospecting Activities:*<br>• Utilization of surface water for drilling activities. | Negative: Very Low |
| | *Direct impacts – Farming Activities:*<br>• Loss of surface water if water related infrastructure; i.e. pipelines, dams and troughs, are not adequately maintained by the surface owner.<br>• Fertilizers utilized for the irrigation activities could cause nitrate pollution. | Negative: Low |
| | *Indirect impacts:*<br>• Possible hydrocarbon spills from prospecting vehicles and equipment at the drilling sites, which could contaminate the surface water.<br>• Possible chemical spills from chemical toilets utilized by the prospecting operation, which could contaminate the surface water.<br>• Possible hydrocarbon spills from farming vehicles and equipment which could contaminate the surface water. | Negative: Very Low |
| | *Cumulative impacts:*<br>• Utilization of surface water for drilling activities. | Negative: Very Low |

| | | |
|---|---|---|
| | • Loss of surface water if water related infrastructure; i.e. pipelines, dams and troughs, are not adequately maintained by the surface owner.<br>• Fertilizers utilized for the irrigation activities could cause nitrate pollution.<br>• Possible hydrocarbon spills from prospecting vehicles and equipment at the drilling sites, which could contaminate the surface water.<br>• Possible chemical spills from chemical toilets utilized by the prospecting operation, which could contaminate the surface water.<br>• Possible hydrocarbon spills from farming vehicles and equipment which could contaminate the surface water. | |

**(vi) Methodology used in determining the significance of environmental impacts:**

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

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

**Nature of impact**

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

**Extent**

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

- **Local**
  The impacted area extends only as far as the activity, e.g. a footprint.
- **Site**
  The impact could affect the whole, or a measurable portion of the property.
- **Regional**
  The impact could affect the area including the neighbouring farms, transport routes and the adjoining towns.

**Duration**

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

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

**Intensity**

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

- **Low**
  This alters the affected environment in such a way that the natural processes or functions are not affected.
- **Medium**
  The affected environment is altered, but function and process continue, albeit in a modified way.

- **High**
  Function or process of the affected environment is disturbed to the extent where it temporarily or permanently ceases.

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

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

- **Improbable**
  The possibility of the impact occurring is very low, due either to the circumstances, design or experience.
- **Probable**
  There is a possibility that the impact will occur to the extent that provisions must be made therefore.
- **Highly probable**
  It is most likely that the impacts will occur at some or other stage of the development.
- **Definite**
  The impact will take place regardless of any preventative plans, and mitigation measures or contingency plans will have to be implemented to contain the impact.

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

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

**(vii) The positive and negative impacts that the proposed activity (in terms of the initial site layout) and alternatives will have on the environment and the community that may be affected:**
(Provide a discussion in terms of advantages and disadvantages of the initial site layout compared to alternative layout options to accommodate concerns raised by affected parties.)

Infrastructure: No offices and storerooms will be established at the site as Xhariep shall make use of facilities in the town of Kimberley / Prieska.

Invasive prospecting: The proposed locality of the exploration boreholes has been placed on a wide grid to determine the economic potential. The final locality of the exploration holes can only be determined after the non-invasive prospecting activities have been completed.

Alternatives considered:-
Infrastructure: The only alternative considered was the establishment of offices and storerooms on the farm under application. As Xhariep aims to minimize its impact on the natural environment as much as possible this option was decided against.

Invasive prospecting: The drilling of boreholes over the entire property was considered, but taking into account that Xhariep aims to minimize its impact on the natural environment as much as possible this option was decided against.

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

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

| Impact | Mitigation | Risk |
|---|---|---|
| Air quality | • Speed limits;<br>• Spraying of surfaces with water // dust-a-side or similar environmentally friendly product;<br>• Avoidance of unnecessary removal of vegetation;<br>• Re-vegetation and monitoring of re-growth;<br>• Rehabilitation of disturbed areas; and<br>• Controlled drilling operations, preferably on wind-free days. | Low |
| Fauna | • Speed limits;<br>• Continuous rehabilitation of disturbed areas;<br>• No snares or traps may be set for animals and strict adherence to be communicated to all employees and contractors; and<br>• Maintenance of firebreaks. | Medium |
| Flora | • Continuous rehabilitation of disturbed areas;<br>• Avoidance of unnecessary removal of vegetation;<br>• Re-vegetation and monitoring of re-growth;<br>• Maintenance of firebreaks;<br>• No trees felled for firewood;<br>• Obtain relevant permit before removal of protected tree or plant species; and<br>• Re-seeding where necessary. | High |
| Ground water | • Immediate removal of any hydrocarbon spill;<br>• Maintenance in dedicated area;<br>• Re-fuelling in dedicated area;<br>• Drip pans;<br>• Storage of hydrocarbons in dedicated areas; and | Low |

| | | |
|---|---|---|
| | • Monitoring of groundwater quality. | |
| Noise | • Hearing protection;<br>• Working hours;<br>• Controlled drilling operations;<br>• Silencers on equipment and vehicles; and | Medium |
| Soil | • Continuous rehabilitation of disturbed areas;<br>• Ripping of compacted areas;<br>• Maintenance & refuelling in dedicated areas;<br>• Drip pans;<br>• Storage of hydrocarbons in dedicated areas; and<br>• Immediate removal of any hydrocarbon spill. | Medium |
| Surface water | • Storm water control;<br>• Control and monitoring of erosion;<br>• Immediate removal of any hydrocarbon spill;<br>• Maintenance & re-fuelling in dedicated areas;<br>• Adhering to buffer zones;<br>• Drip pans; and<br>• Storage of hydrocarbons in dedicated areas. | N/A |
| Topography | • Sloping of rehabilitated and disturbed areas. | N/A |
| Visual | • Sloping of rehabilitated and disturbed areas | Low |

**(ix) Motivation where no alternative sites were considered:**

No offices and storerooms will be established at the site as Xhariep shall make use of facilities in the town of Kimberley / Prieska.

**(x) Statement motivating the preferred site:**

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

No offices and storerooms will be established at the site as Xhariep shall make use of facilities in the town of Kimberley / Prieska.

**i) Full description of the process undertaken to identify, assess and rank the impacts and risks the activity will impose on the preferred site (in respect of the final site layout plan) through the life of the activity.**

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

The methodology for the predication and assessment of impacts has been in accordance with *DEA Guideline 5: Assessment of Alternatives and Impacts*. Potential impacts have been rated in terms of the direct, indirect and cumulative impacts.

Criteria taken into account:

- Spatial extent – The size of the area that will be affected by the impact.
- Intensity –The anticipated severity of the impact.
- Duration –The timeframe during which the impact will be experienced.

Using the criteria above, the impacts have further been assessed in terms of the following:

- Probability –The probability of the impact occurring.
- Significance – Will the impact cause a notable alteration of the environment?
- Status - Whether the impact on the overall environment will be positive, negative or neutral.
- Confidence – The degree of confidence in predictions based on available information and specialist knowledge.

## (j) Assessment of each identified potentially significant impact and risk

| **NAME OF ACTIVITY**<br>(e.g. For prospecting – drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access rout etc…etc…etc<br><br>e.g. For mining - excavations, blasting, stockpiles, discard dumps or dams, loading, hauling and transport, water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc…) | **POTENTIAL IMPACT**<br>(Including the potential impacts for cumulative impacts)<br><br>(e.g. dust, noise, drainage, surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc…etc…) | **ASPECTS AFFECTED** | **PHASE**<br>In which impact is anticipated.<br><br>(e.g. Construction, commissioning, operational, decommissioning, closure, post-closure) | **SIGNIFICANCE**<br>If not mitigated | **MITIGATION TYPE**<br>modify, remedy, control or stop through:<br>(e.g. noise control measures, stormwater control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc…etc…)<br>(e.g. modify through alternative method. Control through noise control. Control through management and monitoring through rehabilitation.) | **SIGNIFICANCE**<br>If mitigated |
|---|---|---|---|---|---|---|
| Access Tracks | • Dust<br>• Disturbance of the natural habitat of fauna<br>• Disturbance / destruction of natural vegetation cover<br>• Groundwater contamination from hydrocarbon spills<br>• Noise from vehicles travelling on the access tracks<br>• Compaction of soil.<br>• Erosion | Air quality<br>Fauna<br>Flora<br>Groundwater<br>Soil<br>Surface water | Phases 3, 5 & 7<br>Drilling | Low | • Maintenance of access tracks / roads<br>• Dust control and monitoring<br>• Groundwater quality monitoring<br>• Noise control and monitoring<br>• Speed limits<br>• Stormwater run-off control<br>• Erosion control<br>• Immediately clean | Very Low |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | • hydrocarbon spills<br>• Rip disturbed areas to allow re-growth of vegetation cover | |
| Chemical toilets | • Soil contamination<br>• Groundwater contamination | Groundwater<br>Soil | Phases 3, 5 & 7<br>Drilling | Very Low | • Maintenance of toilets on regular basis.<br>• Removal of toilets upon closure. | N/A |
| Drilling activities | • Nuisance dust created by drill rig<br>• Disturbance of the natural habitat of fauna<br>• Disturbance / destruction of natural vegetation cover<br>• Ground/ Surface water contamination from hydrocarbon spills<br>• Noise from drill rig<br>• Compaction and / or disturbance of soil structure<br>• Changing of natural aesthetic view of environment by drill rig<br>• Erosion | Air quality<br>Fauna<br>Flora<br>Groundwater<br>Soil<br>Surface water | Phases 3, 5 & 7<br>Drilling | Medium | • Avoidance of unnecessary removal of vegetation<br>• Continuous rehabilitation of disturbed areas, re-vegetation and monitoring of re-growth<br>• Controlled drilling operations, preferably on wind-free days<br>• Immediate removal of any hydrocarbon spill<br>• Maintenance and re-fuelling to take place in dedicated area<br>• Drip pans<br>• Storage of hydrocarbons in dedicated area<br>• Hearing protection<br>• Working hours<br>• Ripping of compacted areas | Low |

**(k) Summary of specialist reports.**

(This summary must be completed if any specialist reports informed the impact assessment and final site layout process and must be in the following tabular form):-

| LIST OF STUDIES UNDERTAKEN | RECOMMENDATIONS OF SPECIALIST REPORTS | SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (mark with an X where applicable) | REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED |
|---|---|---|---|
| Field-Based Heritage Impact Assessment Report (Appendix '9') | "According to Beaumont et al (1995) "thousands of square kilometers of Bushmanland are covered by a low-density lithic scatter" and are referred to as background scatter (Orton 2016), generally of low heritage significance. Stone Age scatters and isolated finds of low heritage significance were recorded during HIA's in the area (e.g., Gaigher 2013, Fourie 2014, van der Walt 2015 and 2018) and similar, isolated finds that can be attributed to background scatter. These are characterized by a mantle of aeolean sand of top of a calcrete substrata and finds are mostly found where the calcrete protrudes through the sand cover. A substantion number of lithic materials were noted but artefacts are mostly dating to the MSA with faceted striking platforms. Graves were recorded in the prospecting area.<br><br>No adverse impact on heritage resources is expected by the project and it is recommended that the project can commence on the condition that the following recommendations are implemented as part of the EMPr and based on approval from | X | The 'Recommendations for condition of Authorisation' and 'Chance Find Procedure' are included under the management objectives on pages 61 – 63. |

| | | | |
|---|---|---|---|
| | SAHRA." | | |
| Field-Based Palaeontological Impact Assessment Report (Appendix '10') | "According to the SAHRA Paleontological sensitivity map the study are is of Moderate palaeontological significance. The study concluded that it is extremely unlikely that any fossils would be preserved in the Aeolian sands of the Gordonia Formation, Kalahari Group (Quaternary). There is a very small chance that fossils may have been trapped in features such as palaeo-pans or palaeo-springs, and buried by the Aeolian sands, but no such feature is visible in the satellite imagery. Nonetheless, a Fossil Chance Find Protocol should be added to the EMPr (Bamford 2022).<br><br>No adverse impact on heritage resources is expected by the project and it is recommended that the project commence on the condition that the following recommendations are implemented as part of the EMPr and based on approval from SAHRA." | X | The 'Recommendations for condition of Authorisation' and 'Chance Find Procedure' are included under the management objectives on page 65. |

Attach copies of Specialist Reports as appendices.

## (l) Environmental impact statement

### (i) Summary of the key findings of the environmental impact assessment;

- The creation of the access tracks will have a very low impact on air quality, fauna, flora, groundwater, soil and surface water after the implementation of mitigation measures.
- The chemical toilets are not expected to have an environmental impact should the mitigation measures be implemented.
- The drilling activities will have a low impact on air quality, fauna, flora, groundwater, soil and surface water after the implementation of mitigation measures.

### (ii) Final Site Map

Provide a map at an appropriate scale which superimposes the proposed overall activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers. Attach as Appendix.

A detailed Site Plan cannot be provided in this early stage of the application process as the locality of the invasive prospecting activities is dependent on the results of the non-invasive prospecting activities.

We do; however; insert below a Conceptual Site Plan indicating all existing infrastructure (i.e. roads) as well as sensitive environmental features to assist with planning when the results of the abovementioned stages have been obtained. No prospecting related infrastructure will be established at the site.

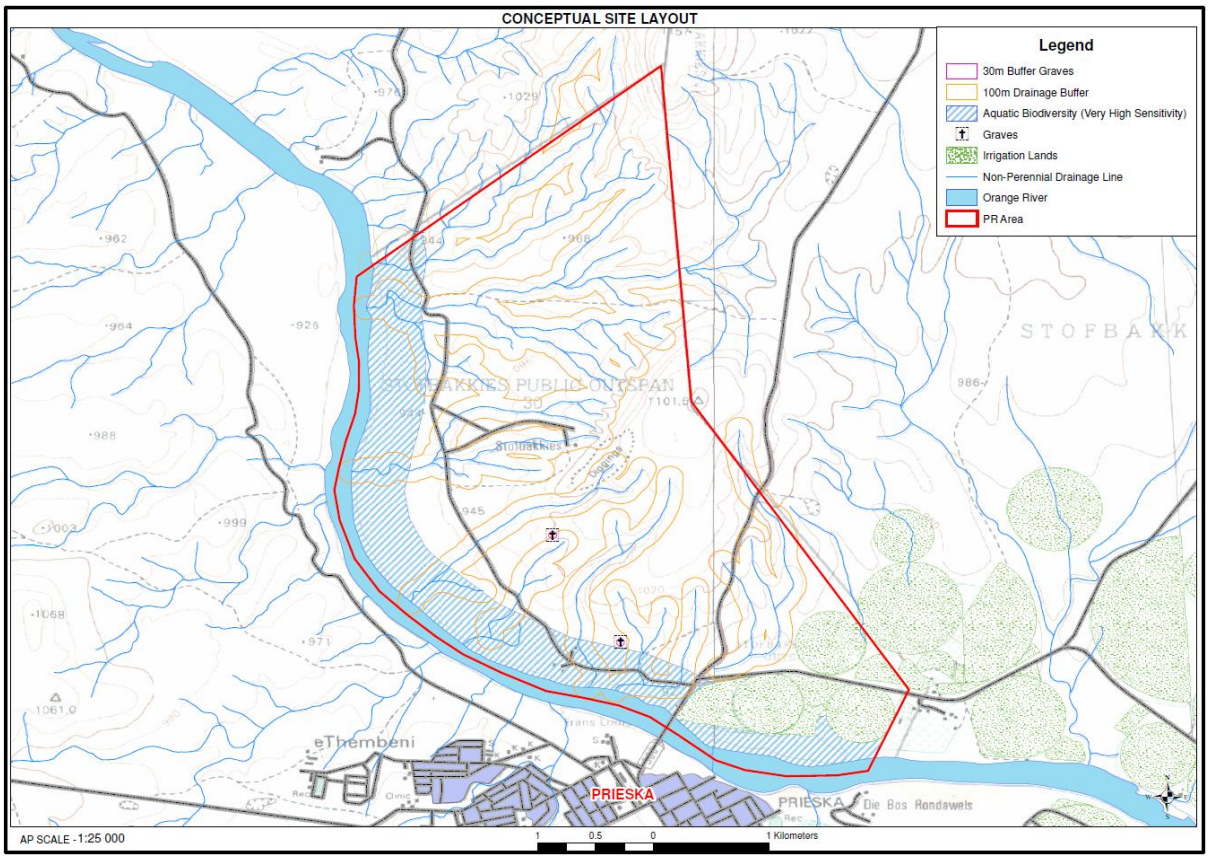



Figure 18 – Site layout with buffer zones

**(iii) Summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;**

Infrastructure: No offices and storerooms will be established at the site as Xhariep shall make use of facilities in the town of Kimberley / Prieska.

Invasive prospecting: The proposed locality of the exploration boreholes has been placed on a wide grid to determine the economic potential. The final locality of the exploration holes can only be determined after the non-invasive prospecting activities have been completed.

Alternatives considered:-
Infrastructure: The only alternative considered was the establishment of offices and storerooms on the farm under application. As Xhariep aims to minimize its impact on the natural environment as much as possible this option was decided against.

Invasive prospecting: The drilling of boreholes over the entire property was considered, but taking into account that Xhariep aims to minimize its impact on the natural environment as much as possible this option was decided against.

**(m) Proposed impact management objectives and the impact management outcomes for inclusion in the EMPr;**

Based on the assessment and where applicable the recommendations from specialist reports, the recording of proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation.

- Archaeological:
  The following recommendations for Environmental Authorisation apply and the project may only proceed based on approval from SAHRA.

  Recommendations:
  - Implementation of Chance Find Procedure for the project.
  - Grave Sites 1 and 2 should be indicated on development plans and avoided with a 30m buffer.

  Chance Find Procedures:
  The possibility of the occurrence of subsurface finds cannot be excluded. Therefore, if during construction any possible finds such as tone tool scatters, artefacts or bone and fossil remains are made, the operations must be stopped; and a qualified archaeologist must be contacted for an assessment of the find and therefore chance find procedures should be put in place as part of the EMPr. A short summary of chance find procedures is discussed below and monitoring guidelines for this procedure also provided.

  This procedure applies to the prospecting company's employees, its subsidiaries, contractors and subcontractors, and service providers. The aim of this procedure is to establish monitoring and reporting procedures to ensure compliance with this policy and its associated procedures. Prospecting crews must be properly inducted to ensure they are fully aware of the procedures regarding chance finds as discussed below.

- If during the pre-construction phase, construction, operations or closure phases of this project, any person employed by Xhariep (Pty) Ltd, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance or heritage site, this person must cease work at the site of the find and report this find to their immediate supervisor, and through their supervisor to the senior on-site manager.
- It is the responsibility of the senior on-site Manager to make an initial assessment of the extent of the find and confirm the extent of the work stoppage in that area.
- The senior on-site Manager will inform the ECO of the chance find and its immediate impact on operations. The ECO will then contact a professional archaeologist for an assessment of the finds who will notify the SAHRA.
- If a human grave/burial is encountered, the remains must be left as undisturbed as possible before the local police and SAHRA or PHRA are informed. If the burial is deemed to be over 60 years old and no foul play is suspected, an emergency exhumation permit may be issued by SAHRA for an archaeologist to exhume the remains.

The following indicators of unmarked sub-surface sites could be encountered:

- Ash deposits (unnaturally grey appearance of soil compared to the surrounding substrate);
- Bone concentrations, either animal or human;
- Ceramic fragments such as pottery shards either historic or pre-contact;
- Stone concentrations of any formal nature.

The following recommendations are given should any sub-surface remains of heritage sites be identified as indicated above:

- All operators of excavation equipment should be made aware of the possibility of the occurrence of sub-surface heritage features and the following procedures should they be encountered.
- All construction in the immediate vicinity (50m radius of the site) should cease.
- The heritage practitioner should be informed as soon as possible.
- In the event of obvious human remains, all activities at the finds must be seized and the South African Police Services (SAPS) should be notified.
- Mitigation measures (such as refilling etc.) should not be attempted.
- The area in a 50m radius of the find should be cordoned off with hazard tape.
- Public access should be limited.
- The area should be placed under guard.
- No media statements should be released until such time as the heritage practitioner has had enough time to analyze the finds.

Monitoring Requirements:
Day to day monitoring can be conducted by the Environmental Control Officers (ECO). The ECO or other responsible persons should be trained along the following lines:

- Induction training: Responsible staff identified by the developer should attend a short course on heritage management and identification of heritage resources.
- Site monitoring and watching brief: As most heritage resources occur below surface, all earth-moving activities need to be routinely monitored in case of accidental discoveries. The greatest potential impacts are from pre-construction and construction activities. The ECO should monitor all such

activities daily. If any heritage resources are found, the chance finds procedure must be followed as outlined above.

- Air quality:
  To limit the creation of nuisance dust the following management guidelines should be followed:
  - Speed limits of vehicles inside the application area will be strictly controlled to avoid excessive dust or the excessive deterioration of the farm roads and access tracks to be used.
  - Routine spraying of unpaved site areas and access tracks utilized by the prospecting operation with water // dust-a-side or similar environmentally friendly product;
  - Avoidance of unnecessary removal of vegetation;
  - All cleared, disturbed or exposed areas must be rehabilitated as soon as practically possible to prevent the forming of additional sources of dust.
  - Monitoring of vegetation re-growth in rehabilitated areas.
  - Drilling activities preferably to take place on wind-free days.

- Fauna
  To ensure a minimum of impact to animals the following management guidelines should be followed:
  - Speed limits of vehicles inside the application area will be strictly controlled to avoid road kills.
  - Continuous rehabilitation of disturbed areas to allow the fauna habitat to be re-established.
  - No hunting (snares) will be allowed at the application area.
  - Maintenance of the firebreak.

- Flora
  - Continuous rehabilitation of disturbed areas to allow the natural vegetation cover to be re-established.
  - Avoidance of unnecessary removal of vegetation cover.
  - Monitoring of vegetation re-growth in rehabilitated areas.
  - Maintenance of firebreak.
  - No trees or shrubs will be felled or damaged for the purpose of obtaining firewood.
  - Management will take responsibility to control declared invader or exotic species on the site. The following control methods will be used:
    - "The plants will be uprooted, felled or cut off and can be destroyed completely."
    - "The plants will be treated with an herbicide that is registered for use in connection therewith and in accordance with the directions for the use of such an herbicide."
  - Valid permits from Northern Cape Nature Conservation will be obtained before any protected plant species are removed.
  - All rehabilitated areas, where applicable and possible, will be seeded with a vegetation seed mix adapted to reflect the local indigenous flora that was present prior to prospecting activities commenced, if the natural succession of vegetation is unacceptably slow.
  - Fires will only be allowed in facilities or equipment specially constructed for this purpose.
  - The end objective of the re-vegetation program will be to achieve a stable self-sustaining habitat unit.

- Groundwater
  - Immediate removal of any hydrocarbon spill.
  - Vehicle- and equipment maintenance will only be allowed within the dedicated maintenance area.
  - Only emergency breakdowns will be allowed in other areas. The following procedure will be followed if a vehicle or piece of equipment would break down outside of the maintenance area.
    - Drip pans will be placed at all points where diesel, oil or hydraulic fluid may drip and in so doing contaminate the soil.
    - All efforts will be made to move the broken down vehicle or piece of equipment to the maintenance area.
    - If the vehicle/piece of equipment cannot be moved, the broken part will firstly be drained of all fluid. The part will then be removed and taken to the maintenance area.
  - Equipment used as part of the proposed operation will be adequately maintained so as to ensure that oil, diesel, grease or hydraulic fluid does not leak during operation.
  - Fuel and other petrochemicals will be stored in steel receptacles that comply with SANS 10089-1:2003 (SABS 089-1:2003) standards.
  - Monitoring of groundwater quality.
  - Proper sanitation facilities will be provided for employees. No person will pollute the workings with faeces or urine, misuse the facilities provided or inappropriately foul the surrounding environment with faeces or urine. Acceptable hygienic and aesthetic practices will be adhered to.

- Noise
  - Hearing protection will be available for all employees where attenuation cannot be implemented.
  - Working hours will be kept between sunrise and sunset as far as possible.
  - As a minimum, ambient noise levels emanating from the prospecting activities will not exceed 82 dBA at the site boundary. When the equivalent noise exposure, as defined in the South African Bureau of Standards Code of Practice for the Measurement and Assessment of Occupational Noise for Hearing Conservation Purposes, SABS 083 as amended, in any place at or in any mine or works where persons may travel or work, exceeds 82 dB (A), the site manager will take the necessary steps to reduce the noise below this level.
  - Xhariep will comply with the occupational noise Regulations of the Occupational Health and Safety Act, Act 85 of 1993.
  - Xhariep will comply with the measures for good practice with regard to management of noise related impacts during construction and operation.
  - The management objective will be to reduce any level of noise, shock and lighting that may have an effect on persons or animals, both inside the drilling area and that which may migrate outside the drilling area.
  - If any complaints are received from the public or state department regarding noise levels the levels will be monitored at prescribed monitoring points.

  Mechanical equipment:
  - All mechanical equipment will be in good working order and vehicles will adhere to the relevant noise requirements of the Road Traffic Act.
  - All vehicles in operation will be equipped with a silencer on their exhaust system.

- Safety measures, which generate noise such as reverse gear alarms on large vehicles, will be appropriately calibrated/adjusted.

- Palaeontological:
  The following recommendations for Environmental Authorisation apply and the project may only proceed based on approval from SAHRA.

  Recommendations:
  - Implementation of a Chance Find Procedure for the project.

  Chance Find Procedures:
  The following procedure is only required if fossils are seen on the surface and when drilling commence.
  - When drilling begins the rocks must be given a cursory inspection by the environmental officer or designated person. Any fossiliferous material (plants, insects, bone, coal) should be put aside in a suitably protected place. This way the project activities will not be interrupted.
  - Photographs of similar fossils must be provided to the developer to assist in recognizing the fossil plants, vertebrates, invertebrates or trace fossils in the shales and mudstones. This information will be built into the EMP's training and awareness plan and procedures.
  - Photographs of the putative fossils can be sent to the palaeontologist for a preliminary assessment.
  - If there is any possible fossil material found by the developer/environmental officer then the qualified palaeontologist sub-contracted for this project, should visit the site to inspect the selected material and check the dumps where feasible.
  - Fossil plants or vertebrates that are of good quality or scientific interest by the palaeontologist must be removed, catalogued and housed in a suitable institution where they can be made available for further study. Before the fossils are removed from the site a SAHRA permit must be obtained. Annual reports must be submitted to SAHRA as required by the relevant permits.
  - If no good fossil material is recovered then no site inspections by the palaeontologist will be necessary. A final report by the palaeontologist must be sent to SAHRA once the project has been completed and only if there are fossils.
  - If no fossils are found and the excavations have finished then no further monitoring is required.

  Monitoring Requirements:
  Day-to-day monitoring can be conducted by the Environmental Control Officers (ECO). The ECO or other responsible persons should be trained along the following lines:
  - Induction training: Responsible staff identified by the developer should attend a short course on heritage management and identification of heritage resources.
  - Site monitoring and watching brief: As most heritage resources occur below surface, all earth-moving activities need to be routinely monitored in case of accidental discoveries. The greatest potential impacts are from pre-construction and construction activities. The ECO should monitor all such activities daily. If any heritage resources are found, the chance finds procedure must be followed as outlined above.

- Soil
  - In all places of development the first 300mm of loose or weathered material found will be classified as a growth medium. The topsoil will be removed, where possible, from all areas where physical disturbance of the surface will occur.
  - In all areas where the above growth medium will be impacted on, it will be removed and stockpiled on a dedicated area. The maximum height of stockpiles will be 2 meters.
  - The growth medium/topsoil will be used during the rehabilitation of any impacted areas, after sloping in order to re-establish the same land capability.
  - If any soil is contaminated during the life of the prospecting area, it will either be treated on site or be removed together with the contaminant and placed in acceptable containers to be removed with the industrial waste to a recognized facility or company.
  - Erosion control in the form of re-vegetation and contouring of slopes will be implemented on disturbed areas in and around the site.
  - The stored topsoil will be adequately protected from being blown away or being eroded.
  - Compacted areas will be ripped to a depth of 300mm, where possible, during the continuous rehabilitation, decommissioning and closure phases of the operation in order to establish a growth medium for vegetation.
  - Vehicle movement will be confined to established roads and access tracks for as far as practical in order to prevent the compaction of soils.

- Surface water
  - The disposal of oil, grease and related industrial waste will be transported to the storage area on a daily basis where it will be stored in steel containers supplied by an oil recycling contractor. All oil and grease will be removed on a regular basis from the operation by a registered approved contractor.
  - All refuse and waste from the different sections will be handled according to NEMA Guidelines. Recycling of waste is encouraged in all the consumer sections of the operation, where recyclable materials will be collected before dumping them in the domestic waste disposal area.
  - All non-biodegradable (recyclable) refuse such as glass bottles, plastic bags and metal scrap will be removed from the site on a regular basis and disposed of at a recognized disposal facility.
  - Erosion and storm water control measures will be implemented.
  - Vehicle repairs will only take place within the maintenance area for vehicles.
  - Re-fuelling will only take place in the re-fuelling area. If this is found not be practical, drip trays will be used whenever re-fuelling takes place outside of this area.
  - During rehabilitation the applicant will endeavour to reconstruct flow patterns in such a way that surface water flow is in accordance with the natural drainage of the area as far as practically possible.
  - Adhering to no-prospecting buffer zones placed around non-perennial drainage lines and the Orange River.

- Topography
  - During rehabilitation the applicant will endeavour to reconstruct flow patterns in such a way that surface water flow is in accordance with the natural drainage of the area as far as practically possible.

- Visual
  - Waste material of any description will be removed from the prospecting area upon completion of the operation and be disposed of at a recognized landfill facility.
  - The drill rigs will be removed from the site upon completion of the prospecting operation.

**(n) Aspects for inclusion as conditions of Authorisation.**
Any aspects which must be made conditions of the Environmental Authorisation.

The general conditions; including management of activity, monitoring, recording and reporting to the Department, commissioning of the activity, operation of the activity, site closure and decommissioning as well as non-compliances; as required in terms of the Environmental Impact Assessment Regulations promulgated in terms of NEMA (Act 107 of 1998) as well as objectives and requirements of relevant legislation, policies and guidelines must be included in the Authorisation.

**(o) Descriptions of any assumptions, uncertainties and gaps in knowledge.**
(Which relate to the assessment and mitigation measures proposed.)

The abovementioned mitigation measures are tried and tested over many years in the prospecting / mining industry. Xhariep will monitor the potential impacts throughout the life of operation, and mitigate any deviations detected. This has been proven to be very effective in existing operations.

The EAP who compiled this document and its annexures have extensive knowledge in her field and it is hereby assumed that the above assumptions are adequate and that the information provided is in the region of 85% - 95% correct.

**(p) Reasoned opinion as to whether the proposed activity should or should not be authorised**

**i) Reasons why the activity should be authorized or not.**

Five measures of economic impacts can be used to demonstrate the potential effect of the proposed prospecting operation on the local economy:

- Employment - The extent of employment can be measured as number of jobs or in terms of full time equivalents.
- Payroll income - The gross remuneration of employees in terms of salaries and wages.
- Capital Expenditure (CAPEX) - The total amount spent on the purchasing of fixed assets and total spent on construction.
- Operating expenditure and maintenance (OPEX) - The total amount spent locally by businesses on goods and services, excluding salaries and wages as well as rents or interest.
- Revenue - The total value of sales arising from business activity at the prospecting operation.

It is recommended that the activity should be authorized for the above reasons.

**ii) Conditions that must be included in the authorisation**

The general conditions; including management of activity, monitoring, recording and reporting to the Department, commissioning of the activity, operation of the activity, site closure and decommissioning as well as non-compliances; as required in terms of the Environmental Impact Assessment Regulations promulgated in terms of NEMA (Act 107 of 1998) as well as objectives and requirements of relevant legislation, policies and guidelines must be included in the Authorisation.

**(q) Period for which the Environmental Authorisation is required.**

Five years

**(r) Undertaking**

Confirm that the undertaking required to meet the requirements of this section is provided at the end of the EMPr and is applicable to both the Basic Assessment Report and the Environmental Management Programme Report.

Xhariep's undertaking to meet the requirements of the Basic Assessment Report and Environmental Management Programme Report is attached at the end of the EMPr and is applicable to both documents.

**(s) Financial Provision**

**State the amount that is required to both manage and rehabilitate the environment in respect of rehabilitation.**

R301 903.64

**(i) Explain how the aforesaid amount was derived.**

The Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA) requires a holder of a right to provide to the Department of Mineral Resources and Energy (DMRE) sufficient financial provision for environmental rehabilitation and closure requirements of mining operations. Regulation 54 of the MPRDA, '*Quantum of financial provision*', as well as the '*Guideline document for evaluation of the quantum of closure-related financial provision provided by a mine*' has been used to calculate the required financial provision for the Xhariep Project.

Furthermore, the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) requires a Right Holder to make financial provision for rehabilitation and remediation; decommissioning and closure activities as well as remediation and management of latent or residual environmental impacts. The '*Regulations pertaining to the financial provision for prospecting, exploration, mining or production operations*' as published on 20 November 2015 under Government Notice R. 1147 of Government Gazette 39425 has also been used to guide the calculations in this report.

Calculation criteria:

1. Master Rates:
   In terms of the guideline document 'the Master Rates in Section B will be updated on an annual basis, based on CPIX or similar approved method. The first of these updates will take place during 2005.'

The 2004 Master Rates were updated annually in terms of the published STATS SA CPI rates:
(http://www.statssa.gov.za/publications/P0141/CPIHistory.pdf).

| Year | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Aver |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2005 | 3,0 | 2,6 | 3,0 | 3,4 | 3,3 | 2,8 | 3,4 | 3,9 | 4,4 | 4,0 | 3,4 | 3,6 | 3,4 |
| 2006 | 4,0 | 3,9 | 3,4 | 3,3 | 3,9 | 4,9 | 5,0 | 5,4 | 5,3 | 5,4 | 5,4 | 5,8 | 4,7 |
| 2007 | 6,0 | 5,7 | 6,1 | 7,0 | 6,9 | 7,0 | 7,0 | 6,7 | 7,2 | 7,9 | 8,4 | 9,0 | 7,1 |
| 2008 | 9,3 | 9,8 | 10,6 | 11,1 | 11,7 | 12,2 | 13,4 | 13,7 | 13,1 | 12,1 | 11,8 | 9,5 | 11,5 |
| 2009 | 8,1 | 8,6 | 8,5 | 8,4 | 8,0 | 6,9 | 6,7 | 6,4 | 6,1 | 5,9 | 5,8 | 6,3 | 7,1 |
| 2010 | 6,2 | 5,7 | 5,1 | 4,8 | 4,6 | 4,1 | 3,7 | 3,5 | 3,2 | 3,4 | 3,6 | 3,5 | 4,3 |
| 2011 | 3,7 | 3,7 | 4,1 | 4,2 | 4,6 | 5,0 | 5,3 | 5,3 | 5,7 | 6,0 | 6,1 | 6,1 | 5,0 |
| 2012 | 6,3 | 6,1 | 6,0 | 6,1 | 5,7 | 5,5 | 4,9 | 5,0 | 5,5 | 5,6 | 5,6 | 5,7 | 5,6 |
| 2013 | 5,4 | 5,9 | 5,9 | 5,9 | 5,6 | 5,5 | 6,3 | 6,4 | 6,0 | 5,5 | 5,3 | 5,4 | 5,7 |
| 2014 | 5,8 | 5,9 | 6,0 | 6,1 | 6,6 | 6,6 | 6,3 | 6,4 | 5,9 | 5,9 | 5,8 | 5,3 | 6,1 |
| 2015 | 4,4 | 3,9 | 4,0 | 4,5 | 4,6 | 4,7 | 5,0 | 4,6 | 4,6 | 4,7 | 4,8 | 5,2 | 4,6 |
| 2016 | 6,2 | 7,0 | 6,3 | 6,2 | 6,1 | 6,3 | 6,0 | 5,9 | 6,1 | 6,4 | 6,6 | 6,8 | 6,4 |
| 2017 | 6,6 | 6,3 | 6,1 | 5,3 | 5,4 | 5,1 | 4,6 | 4,8 | 5,1 | 4,8 | 4,6 | 4,7 | 5,3 |
| 2018 | 4,4 | 4,0 | 3,8 | 4,5 | 4,4 | 4,6 | 5,1 | 4,9 | 4,9 | 5,1 | 5,2 | 4,5 | 4,7 |
| 2019 | 4,0 | 4,1 | 4,5 | 4,4 | 4,5 | 4,5 | 4,0 | 4,3 | 4,1 | 3,7 | 3,6 | 4,0 | 4,1 |
| 2020 | 4,5 | 4,6 | 4,1 | 3,0 | 2,1 | 2,2 | 3,2 | 3,1 | 3,0 | 3,3 | 3,2 | 3,1 | 3,3 |
| 2021 | 3,2 | 2,9 | 3,2 | 4,4 | 5,2 | 4,9 | 4,6 | 4,9 | 5,0 | 5,0 | 5,5 | 5,9 | 4,5 |
| 2022 | 5,7 | 5,7 | 5,9 | 5,9 | 6,5 | 7,4 | 7,8 | 7,6 | 7,5 | 7,6 | 7,4 | 7,2 | 6,9 |
| 2023 | 6,9 | 7,0 | 7,1 | | | | | | | | | | |

2. Procedure to determine the quantum for financial provision:
   2.1. Step 1 – Determine mineral mined and saleable by-products:
   In terms of Tables B.12 and B.13 of the Guideline Document the activities to be conducted under the Prospecting Right has been classified as a Small Mine under the category 'Mine, mine waste'. Xhariep will not establish a processing plant at the site.

   The primary risk class for the type of mineral mined / processed are as follows:

| Mineral | Table | Primary Risk Class |
|---|---|---|
| Diamond<br>- Alluvial<br>- General<br>- In Kimberlite | B.12 | Risk Class C (Low) |

   2.2. Step 2A – Determine primary risk class:
   The primary risk class in terms of the information contained in Tables B.12 and B.13 the primary risk class for the project is Class C (Low Risk).

   2.3. Step 2B – Revise primary risk class (if applicable) based on saleable by-products:
   Not applicable – No by-products have been identified.

   2.4. Step 3 – Determine environmental sensitivity of mine area:
   The site the sensitivity of the PR area, in terms of Table B.4 of the Guideline Document, has been determined as follows:

| Sensitivity | Sensitivity criteria | | |
|---|---|---|---|
| | Biophysical | Social | Economic |
| Low | | X | X |
| Medium | X | | |
| High | | | |

2.5. Step 4 – For Class A or B mining operations:
Not applicable – the proposed operation has been classified as Class C: Low Risk

2.6. Step 5 – For Class C Mining operations:
The rates (per hectare) to determine the quantum for financial provision – Class C mines – as per Table B.11 is as follows:

| | Environmental sensitivity of mine area | | |
|---|---|---|---|
| | Low | Medium | High |
| Rate per hectare to determine the quantum (rands) | 20 000.00 | 50 000.00 | 80 000.00 |
| Minimum amount | R 10 000.00 | | |

Xhariep's prospecting operation has been classified as a "Class C – Low Risk" mine with a "Medium" environmental sensitivity.

The calculation of quantum is thus as follows:

- Footprints:
  Boreholes: 1.60 Ha
  Roads: 0.15 Ha
  Total hectares 1.75 Ha

- Master rates:
  The R50 000-00 Master Rate of 2005 was escalated annually as per Section A.1, number 1.2 of the Quantum Guideline Document.

- Weighting factors:
  Weighting Factor 1 – Nature of Terrain = 1.10
  The nature of the terrain has been determined as Undulating: A mix of sloped and undulating areas within the PR area.

  Weighting Factor 2 – Proximity to urban area = 1.05
  The proximity to urban area where goods and services are to be supplied has been determined as Peri-Urban: Less than 150km from a developed urban area.

- Quantum:

**CALCULATION OF THE QUANTUM**

Applicant: **XHARIEP PLANT AND MINING (PTY) LTD** **Ref No:** **NC 13476 PR**
**Date:** **MAY 2023**

| No. | Description | Unit | A Quantity | B Master Rate | 2005 | C Multiplication factor | D Weighting factor 1 | E=A*B*C*D Amount (Rands) |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| 1 | Rate per hectare to determine the quantum (Low) | Ha | 0.00 | 47 107.59 | 20 000.00 | 1 | 1.1 | 0.00 |
| 2 | Rate per hectare to determine the quantum (Medium) | Ha | 1.75 | 113 696.58 | 50 000.00 | 1 | 1.1 | 218 865.92 |
| 3 | Rate per hectare to determine the quantum (High) | Ha | 0.00 | 181 914.53 | 80 000.00 | 1 | 1.1 | 0.00 |
| | | | | | | **Total of 1 - 15 above** | | **218 865.92** |

| weighting factor 2 |
|---|
| 1.05 |

| | | |
|---|---|---|
| | **Subtotal 1** | **229 809.21** |
| 1 Preliminary and General | 13 131.95 | 13 131.95 |
| 2 Contingencies | 21 886.59 | 21 886.59 |
| | **Subtotal 2** | **264 827.76** |
| | VAT (14%) | 37 075.89 |
| | **Grand Total** | **301 903.64** |

**(ii) Confirm that this amount can be provided for from operating expenditure.**
(Confirm that the amount, is anticipated to be an operating cost and is provided for as such in the Mining Work Programme, Financial and Technical Competence Report or Prospecting Work Programme as the case may be.)

Provision has been made in table 9.1 of the Prospecting Work Programme for rehabilitation.

**(t) Specific information required by the competent Authority**
**Compliance with the provisions of Sections 24(4)(a) and (b) read with Section 24(3)(a) and (7) of the National Environmental Management Act (Act 107 of 1998). The EIA report must include the:-**

**(1) Impact on the socio-economic conditions of any directly affected parson.**
(Provide the results of investigation, assessment, and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any directly affected person including the landowner, lawful occupier, or, where applicable, potential beneficiaries of any land restitution claim, attach the investigation report as an Appendix.)

- Impact on landowner:
  Positive: Compensation of land lost to prospecting.
  Negative: Temporary loss of grazing land.
- Impact on other I&AP:
  - Employment - The extent of employment can be measured as number of jobs or in terms of full time equivalents.
  - Payroll income - The gross remuneration of employees in terms of salaries and wages.
  - Capital Expenditure (CAPEX) - The total amount spent on the purchasing of fixed assets and total spent on construction.

- Operating expenditure and maintenance (OPEX) - The total amount spent locally by businesses on goods and services, excluding salaries and wages as well as rents or interest.
- Revenue - The total value of sales arising from business activity at the prospecting operation.

**(2) Impact on any national estate referred to in Section 3(2) of the National Heritage Resources Act.**

The Heritage Impact Assessment Report and Palaeontological Heritage Report should list a number of recommendations relating to any archaeological or palaeontological finds.

Should these recommendations be adhered to by Xhariep, no impact on any national estate in terms of Section 3(2) of the National Heritage Resources Act is foreseen.

**(u) Other matters required in terms of Sections 24(4)(a) and (b) of the Act.**

(The EAP managing the application must provide the competent authority with detailed, written proof of an investigation as required by Section 24(4)(b)(i) of the Act and motivation if no reasonable or feasible alternatives, as contemplated in sub-regulation 22(2)(h), exist. The EAP must attach such motivation as Appendix.)

No viable alternatives were found.

# PART B
# ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

## a) Details of the EAP

(Confirm that the requirement for the provision of the details and expertise of the EAP are already included in PART A, Section 1(a) herein as required.)

Refer to Part A, page 4 of this document for the details of the EAP.

## b) Description of the Aspects of the Activity

(Confirm that the requirement to describe the aspects of the activity that are covered by the draft environmental management programme is already included in Part A, Section (1)(h) herein as required.)

Xhariep's prospecting activities for Diamond (Alluvial, General, In Kimberlite), shall be conducted in nine phases over a period of five years.

| Phase | Activity<br>(what are the activities that are planned to achieve optimal prospecting) | Skill(s) required<br>(refers to the competent personnel that will be employed to achieve the required results) | Timeframe<br>(in months) for the activity) | Outcome<br>(What is the expected deliverable, e.g. Geological report, analytical results, feasibility study, etc.) | Timeframe for outcome<br>(deadline for the expected outcome to be delivered) | What technical expert will sign off on the outcome?<br>(e.g. geologist, mining engineer, surveyor, economist, etc) |
|---|---|---|---|---|---|---|
| 1 | **Non-invasive Prospecting**<br>Reconnaissance visit | Geologist | Month 1 | Memorandum to address any problems | Month 2 | Geologist |
| 2 | **Non-invasive Prospecting**<br>Review of historical activities; Desktop study; and Geological Mapping | Geologist | Month 2 - 12 | Map & Report | Month 13 | Geologist |
| 3 | **Invasive Prospecting**<br>Phase 1 Percussion drilling | Geologist & Drilling contractor | Month 13 - 24 | Drill logs | Month 24 | Geologist |
| 4 | **Non-invasive Prospecting**<br>Analysis of drill samples | Laboratory | Month 13 – 24 (Concurrent with drilling) | • Analyses sheets<br>• Laboratory report<br>• Map<br>• Report | Month 24 | Laboratory & Geologist |
| 5 | **Invasive Prospecting**<br>Phase 2 RC drilling | Geologist & Drilling contractor | Month 25 – 36 | Drill logs | Month 36 | Geologist |
| 6 | **Non-invasive Prospecting**<br>Analysis of drill samples | Laboratory | Month 25 – 36 (Concurrent with drilling) | • Analyses sheets<br>• Laboratory report<br>• Map<br>• Report | Month 36 | Laboratory & Geologist |
| 7 | **Invasive Prospecting**<br>Phase 3 RC drilling | Geologist & Drilling contractor | Month 37 - 48 | Drill logs | Month 48 | Geologist |
| 8 | **Non-invasive Prospecting**<br>Analysis of drill samples | Laboratory | Month 37 - 48 (Concurrent with drilling) | • Analyses sheets<br>• Laboratory report<br>• Map<br>• Report | Month 48 | Laboratory & Geologist |
| 9 | **Non-Invasive Prospecting**<br>Consolidation and interpretation of results / data | Geologist | Month 49 - 60 | Feasibility Report | Month 60 | Geologist & CEO |

## c) Composite Map

(Provide a map (Attached as an Appendix) at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities on the preferred site, indicating any areas that should be avoided, including buffers.)

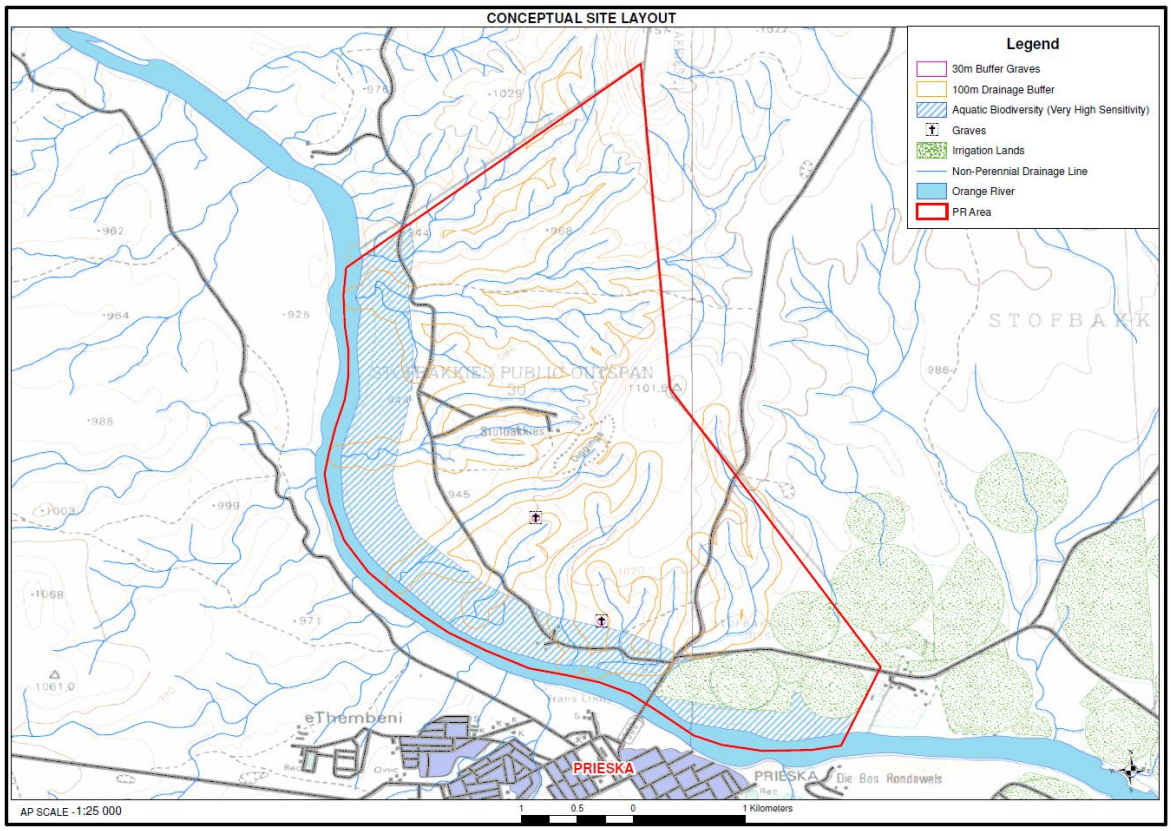



Figure 19 – Conceptual site layout (See Appendix '4')

## d) Description of Impact Management Objectives including management statements

### (i) Determination of closure objectives

(Ensure that the closure objectives are informed by the type of environment described.)

- The main closure objective of Xhariep's planned prospecting operation is to restore the site to its current land capability in a sustainable matter.
- To prevent the sterilization of any ore reserves.
- To prevent the establishment of any permanent structures or features.
- To manage and limit any impact to the surface and groundwater aquifers in such a way that an acceptable water quality and yield can still be obtained, when a closure certificate is issued.
- To establish a stable and self sustainable vegetation cover.
- To limit and rehabilitate any erosion features and prevent any permanent impact to the soil capability.
- To limit and manage the visual impact of the prospecting activities.
- To safeguard the safety and health of humans and animals on the site.
- To close the prospecting operation efficiently, cost effectively and in accordance with Government Policy.

**(ii) Volumes and rate of water use required for the operation.**

The only water use at the site will be for domestic use (drinking water). The drilling team, consisting of five people, will be on the site during Phases 3, 5 and 7 of the prospecting operation. Provision for 50 litres of water per day is made for drinking water.

Xhariep plans to make use of a percussion drill rig during the first phase of drilling. Should an alternative type of drill, i.e. reverse circulation, be utilized during follow up drilling, water for the drill rig will be needed.

**(iii) Has a water use license been applied for?**

Xhariep considers the following water use alternatives:

- Municipal water: Xhariep obtains municipal water from a nearby town. The municipal water will be transported to the site.
- Groundwater: Xhariep makes use of groundwater for the drinking water and for the drilling rigs.
- Surface water: Xhariep makes use of water from the Orange River for the drilling rigs.

The Acting Director-General of Water and Sanitation has, in terms of Section 39 of the National Water Act, published the revised General Authorisation (GNR 538 of 02 September 2016) pertaining to the taking and storing of water, water uses in terms of Section 21(a) and 21(b) of the National Water Act respectively.

The General Authorisation came into effect on 1 March 2017 and replaced the General Authorisation for the taking and storing of water contained in GNR399 of 26 March 2004. In terms of clause 7.2 of the Schedule to the 2017 General Authorisations, registration of a water use is only required if more than 10m³ of water is taken from a groundwater resource per day on average over a year on a property.

As stated in paragraph d(ii) above, Xhariep's water use shall not exceed 10 000 litres (10m³) per day. Accordingly, Xhariep is not required to apply for a water use license or register its water use after 3 March 2017 with the responsible authority by virtue of clause 7 of the 2017 General Authorisations.

Xhariep shall obtain relevant authorisation, where necessary, for its intended water use/s before invasive prospecting activities commence. The water use alternative decided upon, once invasive prospecting commences, shall be set out in the surface use agreement with the surface owner.

**(iv) Impacts to be mitigated in their respective phases**
**Measures to rehabilitate the environment affected by the undertaking of any listed activity.**

| **ACTIVITY**<br>(e.g. For prospecting – drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access rout etc…etc…etc<br><br>e.g. For mining - excavations, blasting, stockpiles, discard dumps or dams, loading, hauling and transport, water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc…) | **PHASE**<br>Of operation in which activity will take place<br><br>State: Planning and design, pre-construction, construction, operational, rehabilitation, closure, post-closure | **SIZE AND SCALE of disturbances**<br>Volumes, tonnages and hectares or m²) | **MITIGATION MEASURES**<br>(describe how each of the recommendations herein will remedy the cause of pollution or degradation and migration of pollutants.) | **COMPLIANCE WITH STANDARDS**<br>(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities) | **TIME PERIOD FOR IMPLEMENTATION**<br>Describe the time period when the measures in the environmental management programme must be implemented. Measures must be implemented when required.<br><br>With regard to rehabilitation specifically this must take place at the earliest opportunity. With regard to rehabilitation, therefore state either:<br>- Upon cessation of the individual activity, or<br>- Upon cessation of the mining, bulk sampling or alluvial diamond prospecting as the case may be. |
|---|---|---|---|---|---|
| Two-Spoor Access Tracks | Operational<br>Rehabilitation<br>Closure | 1 500m² | • Maintenance of roads / access tracks.<br>• Dust control and monitoring.<br>• Groundwater quality monitoring<br>• Noise control and monitoring.<br>• Speed limits.<br>• Stormwater run-off control<br>• Erosion control<br>• Immediately clean hydrocarbon spills | The following must be placed at the site and is applicable to all activities:<br>○ Relevant Legislation;<br>○ Acts;<br>○ Regulations;<br>○ COP's; and<br>○ SOP's<br>Management and staff must be trained to understand the contents of these documents, and | Ripping of access tracks upon closure of prospecting right. |

| | | | | | |
|---|---|---|---|---|---|
| | | | • Ripping of access tracks / roads upon closure. | to adhere to thereto.<br>• Environmental Awareness Training must be provided to employees.<br>• The operation must have a rehabilitation and closure plan. Management and staff must be trained to understand the contents of these documents, and to adhere to thereto.<br><br>Bi-annually Performance Assessment Reports and Quantum Calculations must be done to ensure that the operation adheres to the contents of the BAR & EMPr documents. | |
| Chemical toilets | Operational<br>Closure | 6m² each | • Maintenance of the toilets.<br>• Removal of toilets upon closure. | | Removal of toilets upon closure of prospecting right. |
| Drilling activities | Operational<br>Rehabilitation<br>Closure | 1.6 Ha | • Avoidance of unnecessary removal of vegetation.<br>• Continuous rehabilitation of disturbed areas, re-vegetation and monitoring of re-growth<br>• Controlled drilling operations, preferably on wind-free days<br>• Immediate removal of any hydrocarbon spills<br>• Maintenance and re-fuelling to take place in dedicated area<br>• Drip pans<br>• Storage of hydrocarbons in dedicated area<br>• Hearing protection<br>• Working hours kept between sun-up and sun-down<br>• Ripping of compacted / disturbed areas | | Ripping of disturbed areas upon closure of prospecting right. |

## e) Impact Management Outcomes

(A description of impact management outcomes, identifying the standard of impact management required for the aspects contemplated in paragraph.)

| **ACTIVITY**<br>(whether listed or not listed)<br><br>(e.g. excavations, blasting, stockpiles, discard dumps or dams, loading, hauling and transport, water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc…) | **POTENTIAL IMPACT**<br>(Including the potential impacts for cumulative impacts)<br><br>(e.g. dust, noise, drainage, surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc…etc…) | **ASPECTS AFFECTED** | **PHASE**<br>In which impact is anticipated.<br><br>(e.g. Construction, commissioning, operational, decommissioning, closure, post-closure) | **MITIGATION TYPE**<br>modify, remedy, control or stop through:<br>(e.g. noise control measures, stormwater control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc…etc…)<br>(e.g. modify through alternative method. Control through noise control. Control through management and monitoring through rehabilitation.) | **STANDARD TO BE ACHIEVED**<br>(Impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives etc.) |
|---|---|---|---|---|---|
| Access tracks | • Dust<br>• Disturbance of the natural habitat of fauna<br>• Disturbance / destruction of natural vegetation cover<br>• Groundwater contamination from hydrocarbon spills<br>• Noise from vehicles travelling on the access tracks<br>• Compaction of soil.<br>• Erosion | Air quality<br>Fauna<br>Flora<br>Groundwater<br>Soil<br>Surface water | Operational<br>Rehabilitation<br>Closure | • Maintenance of access tracks<br>• Dust control and monitoring<br>• Groundwater quality monitoring<br>• Noise control and monitoring<br>• Speed limits<br>• Stormwater run-off control.<br>• Erosion control<br>• Immediately clean hydrocarbon spills<br>• Rip disturbed areas to allow re-growth of vegetation cover | • Safety ensured.<br>• Dust levels minimized.<br>• Minimize potential for hydrocarbon spills to infiltrate into groundwater.<br>• Noise levels minimized.<br>• Rehabilitation standards and closure objectives met.<br>• Erosion potential minimized. |

| | | | | | |
|---|---|---|---|---|---|
| Chemical toilets | • Soil contamination<br>• Groundwater contamination | Groundwater<br>Soil | Operational<br>Closure | • Maintenance of toilets on regular basis.<br>• Removal of toilets upon closure. | • Minimize the potential for a chemical spill on soil, which could infiltrate to groundwater. |
| Drilling activities | • Nuisance dust created by drill rig<br>• Disturbance of the natural habitat of fauna<br>• Disturbance / destruction of natural vegetation cover<br>• Groundwater contamination from hydrocarbon spills<br>• Noise from drill rig<br>• Compaction and / or disturbance of soil structure<br>• Changing of natural aesthetic view of environment by drill rig | Air quality<br>Fauna<br>Flora<br>Groundwater<br>Soil<br>Surface water | Operational<br>Rehabilitation<br>Closure | • Avoidance of unnecessary removal of vegetation<br>• Continuous rehabilitation of disturbed areas, re-vegetation and monitoring of re-growth<br>• Controlled drilling operations, preferably on wind-free days<br>• Immediate removal of any hydrocarbon spill<br>• Maintenance and re-fuelling to take place in dedicated area<br>• Drip pans<br>• Storage of hydrocarbons in dedicated area<br>• Hearing protection<br>• Working hours<br>• Ripping of compacted areas | • Dust levels minimized.<br>• Rehabilitation standards and closure objectives met.<br>• Minimize potential for hydrocarbon spills to infiltrate into groundwater.<br>• Erosion potential minimized.<br>• Noise levels minimized. |

## f) Impact Management Actions

(A description of impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraphs © and (d) will be achieved.)

| **ACTIVITY**<br>(whether listed or not listed)<br><br>(e.g. excavations, blasting, stockpiles, discard dumps or dams, loading, hauling and transport, water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc…) | **POTENTIAL IMPACT**<br>(Including the potential impacts for cumulative impacts)<br><br>(e.g. dust, noise, drainage, surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc…etc…) | **MITIGATION MEASURES**<br>(describe how each of the recommendations herein will remedy the cause of pollution or degradation and migration of pollutants.) | **TIME PERIOD FOR IMPLEMENTATION**<br>Describe the time period when the measures in the environmental management programme must be implemented. Measures must be implemented when required.<br><br>With regard to rehabilitation specifically this must take place at the earliest opportunity. With regard to rehabilitation, therefore state either:<br>- Upon cessation of the individual activity, or<br>- Upon cessation of the mining, bulk sampling or alluvial diamond prospecting as the case may be. | **COMPLIANCE WITH STANDARDS**<br>(A description of how each of the recommendations in 2.11.6 read with 2.12 and 2.15.2 herein will comply with any prescribed management standards or practices that have been identified by Competent Authorities.) |
|---|---|---|---|---|
| Access tracks | • Dust<br>• Disturbance of the natural habitat of fauna<br>• Disturbance / destruction of natural vegetation cover<br>• Groundwater contamination from hydrocarbon spills<br>• Noise from vehicles travelling on the access tracks<br>• Compaction of soil.<br>• Erosion | • Maintenance of access tracks / roads<br>• Dust control and monitoring<br>• Groundwater quality monitoring<br>• Noise control and monitoring<br>• Speed limits<br>• Stormwater run-off control.<br>• Erosion control<br>• Immediately clean hydrocarbon spills<br>• Rip disturbed areas to allow re-growth of vegetation cover | Ripping of access tracks upon closure of prospecting right. | The following must be placed at the site and is applicable to all activities:<br>○ Relevant Legislation;<br>○ Acts;<br>○ Regulations;<br>○ COP's; and<br>○ SOP's<br><br>Management and staff must be trained to understand the contents of these documents, and to adhere to thereto. |
| Chemical toilets | • Soil contamination<br>• Groundwater | • Maintenance of toilets on regular basis. | Removal of toilets upon closure of prospecting right. | The following must be placed at the site and is |

| | | | | |
|---|---|---|---|---|
| | contamination | • Removal of toilets upon closure. | | applicable to all activities:<br>○ Relevant Legislation;<br>○ Acts;<br>○ Regulations;<br>○ COP's; and<br>○ SOP's<br><br>Management and staff must be trained to understand the contents of these documents, and to adhere to thereto. |
| Drilling activities | • Nuisance dust created by drill rig<br>• Disturbance of the natural habitat of fauna<br>• Disturbance / destruction of natural vegetation cover<br>• Groundwater contamination from hydrocarbon spills<br>• Noise from drill rig<br>• Compaction and / or disturbance of soil structure<br>• Changing of natural aesthetic view of environment by drill rig | • Avoidance of unnecessary removal of vegetation<br>• Continuous rehabilitation of disturbed areas, re-vegetation and monitoring of re-growth<br>• Controlled drilling operations, preferably on wind-free days<br>• Immediate removal of any hydrocarbon spill<br>• Maintenance and re-fuelling to take place in dedicated area<br>• Drip pans<br>• Storage of hydrocarbons in dedicated area<br>• Hearing protection<br>• Working hours<br>• Ripping of compacted areas | Ripping of drilling sites upon closure of prospecting right. | The following must be placed at the site and is applicable to all activities:<br>○ Relevant Legislation;<br>○ Acts;<br>○ Regulations;<br>○ COP's; and<br>○ SOP's<br><br>Management and staff must be trained to understand the contents of these documents, and to adhere to thereto. |

## g) Financial Provision

### (1) Determination of the amount of Financial Provision.

**a. Describe the closure objectives and the extent to which they have been aligned to the baseline environment described under the Regulation.**

- The main closure objective of Xhariep's planned prospecting operation is to restore the site to its current land capability in a sustainable matter.
- To prevent the sterilization of any ore reserves.
- To prevent the establishment of any permanent structures or features.
- To manage and limit any impact to the surface and groundwater aquifers in such a way that an acceptable water quality and yield can still be obtained, when a closure certificate is issued.
- To establish a stable and self sustainable vegetation cover.
- To limit and rehabilitate any erosion features and prevent any permanent impact to the soil capability.
- To limit and manage the visual impact of the prospecting activities.
- To safeguard the safety and health of humans and animals on the site.
- To close the prospecting operation efficiently, cost effectively and in accordance with Government Policy.

**b. Confirm specifically that the environmental objectives in relation to closure have been consulted with landowner and interested and affected parties.**

A meeting was held on the 5th of July 2023 with the surface owner. The surface owner was provided with a copy of the draft BAR/EMPr document. The closure objectives of Xhariep, as contained in the BAR/EMPR, were discussed during this meeting.

**c. Provide a rehabilitation plan that describes and shows the scale and aerial extent of the main prospecting activities, including the anticipated prospecting area at the time of closure.**

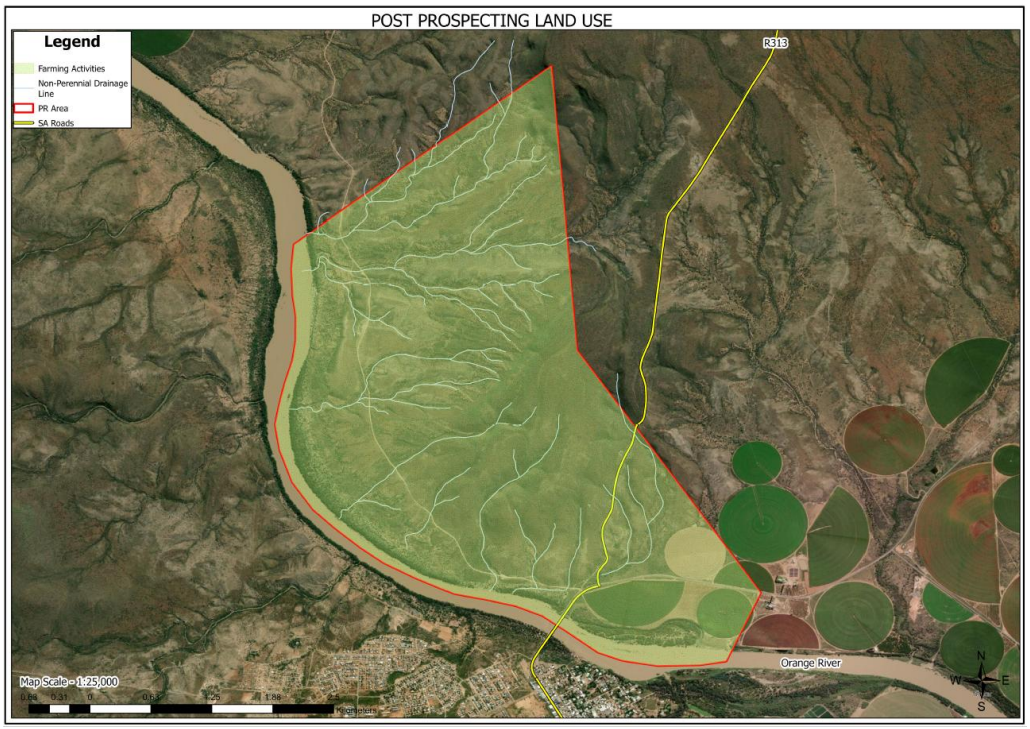



Figure 20 – Post prospecting land use map

Rehabilitation Plan:

- Rehabilitation of boreholes
  - All shallow boreholes (i.e. <10m) will be backfilled and levelled.
  - All boreholes deeper than 10m will be covered with a metal plate and 1000mm of previously stored topsoil.

- Final rehabilitation of access tracks and / roads
  After rehabilitation has been completed, all roads will be ripped or ploughed, providing the landowner does not want them to remain that way and with written approval from the Director Mineral Development of the Department of Mineral Resources and Energy.

- Submission of information
  Reports on rehabilitation and monitoring will be submitted biennially to the Department of Mineral Resources and Energy - Kimberley, as described in Regulation 55.

- Maintenance (Aftercare)
  Maintenance after closure will mainly concern the regular inspection and monitoring and/or completion of the re-vegetation programme for a period of at least two rainy seasons.

  The aim of this Environmental Management Plan is for rehabilitation to be stable and self-sufficient, so that the least possible aftercare is required.

  The aim with the closure of the prospecting operation will be to create an acceptable post-prospecting environment and land-use. Therefore all agreed commitments will be implemented by Prospecting Management.

- After-effects following closure
  - Acid drainage
    No potential for bad quality leach ate or acid drainage development exists.

  - Long term impact on ground water and / or surface water.
    No after effect on the groundwater yield or quality or surface water quality is expected.

  - Long-term stability of rehabilitated land
    One of the main aims of any rehabilitated ground will be to obtain a self-sustaining and stable end result. Xhariep's prospecting activities will not include bulk sampling which could impact on the stability of the land.

**d. Explain why it can be confirmed that the rehabilitation plan is compatible with the closure objectives.**

The main closure objective of Xhariep's planned prospecting operation is to restore the site to its current land capability in a sustainable matter. The rehabilitation activities proposed in the above rehabilitation plan will ensure that the land reverts back to grazing land upon closure of the prospecting right.

**e. Calculate and state the quantum of the financial provision required to manage and rehabilitate the environment in accordance with the applicable guideline.**

**CALCULATION OF THE QUANTUM**

Applicant: **XHARIEP PLANT AND MINING (PTY) LTD** **Ref No:** **NC 13476 PR**
**Date:** **MAY 2023**

| No. | Description | Unit | A Quantity | B Master Rate | 2005 | C Multiplication factor | D Weighting factor 1 | E=A*B*C*D Amount (Rands) |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| 1 | Rate per hectare to determine the quantum (Low) | Ha | 0.00 | 47 107.59 | 20 000.00 | 1 | 1.1 | 0.00 |
| 2 | Rate per hectare to determine the quantum (Medium) | Ha | 1.75 | 113 696.58 | 50 000.00 | 1 | 1.1 | 218 865.92 |
| 3 | Rate per hectare to determine the quantum (High) | Ha | 0.00 | 181 914.53 | 80 000.00 | 1 | 1.1 | 0.00 |
| | | | | | | **Total of 1 - 15 above** | | **218 865.92** |

| weighting factor 2 |
|---|
| 1.05 |

| | |
|---|---|
| **Subtotal 1** | **229 809.21** |

| | | | |
|---|---|---|---|
| 1 | Preliminary and General | 13 131.95 | 13 131.95 |
| 2 | Contingencies | 21 886.59 | 21 886.59 |
| | | **Subtotal 2** | **264 827.76** |
| | | VAT (14%) | 37 075.89 |
| | | **Grand Total** | **301 903.64** |

**f. Confirm that the financial provision will be provided as determined.**

Xhariep shall submit to the DMRE a financial guarantee upon request therefore.

**h) Mechanisms for monitoring compliance with and performance assessment against the environmental management programme and reporting thereon, including:**

**a. Monitoring of Impact Management Actions**
**b. Monitoring and reporting frequency**
**c. Responsible persons**
**d. Time period for implementing impact management actions**
**e. Mechanism for monitoring compliance**

| SOURCE ACTIVITY | IMPACTS REQUIRING MONITORING PROGRAMMES | FUNCTIONAL REQUIREMENTS FOR MONITORING | ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES) | MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS |
|---|---|---|---|---|
| - Access tracks<br>- Drilling activities | Air quality | A single bucket monitoring system must be placed on the site during the drilling phase to measure the air quality levels and to ensure that Xhariep's operation adheres to the Management Standards as set out in the Atmospheric Pollution Prevention Act (45 of 1965), the Regulations of the MPRDA (28 of 2002) and the Mine, Health and Safety Act (29 of 1996). | Project manager<br>EAP | Monthly fall-out dust sampling and quarterly reporting to DMRE during phases 3, 5 and 7. |
| - Access tracks<br>- Drilling activities | Flora | A registered mine surveyor must conduct measurements of disturbed and rehabilitated areas on a quarterly basis. The measurements must be plotted on plans and kept for life of operation. | Project manager<br>EAP | Annual surveys and included with performance assessment reports submitted to the DMRE biennially. |
| - Access tracks<br>- Drilling activities | Groundwater | Water samples must be taken and analysed to ensure that they comply with the SANS 241-1:2011 drinking water quality. Water levels must be measured. | Project manager<br>EAP | Biennial analysis and included with performance assessment reports and submitted to the DMRE biennially. |

| | | | | |
|---|---|---|---|---|
| - Access tracks<br>- Drilling activities | Noise | Noise readings must be taken at pre-determined noise monitoring points with sufficient, calibrated sound level meter during drilling activities. | Project manager<br>EAP | Monthly analysis and included with performance assessment reports and submitted to the DMRE biennially. |

**i) Indicate the frequency of the submission of the performance assessment / environmental audit report.**

An Audit Report will be conducted biennially in line with Regulation 26(e) of the Environmental Impact Assessment Regulations, 2014 of the National Environmental Management Act, 1998 (Act no 107 of 1998) (NEMA) and per Regulation 55(2) of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA).

**j) Environmental Awareness Plan**

**(1) Manner in which the applicant intends to inform his or her employees of any environmental risk which may result from their work.**

Xhariep shall provide and discuss the Environmental Awareness Plan with each employee during pre-employment induction. Monthly Environmental Awareness training shall be provided during life of operation.

**(2) Manner in which risks will be dealt with in order to avoid pollution or the degradation of the environment.**

Xhariep shall ensure that there is an Emergency Response Plan on site, clearly indicating the different procedures to potential incidents.

**k) Specific information required by the Competent Authority**
(Amongst others, confirm that the financial provision will be reviewed annually.)

The financial quantum will be conducted annually as is prescribed by Regulation 54 of the MPRDA and Regulations pertaining to the financial provision for prospecting, exploration, mining or production operations of the NEMA.

Xhariep shall provide the DMRE with a progress and results report annually.

**UNDERTAKING**

The EAP herewith confirms:

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

b) the inclusion of comments and inputs from stakeholders and I&APs; ☒

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

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

Signature of the Environmental Assessment Practitioner:

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29 SEPTEMBER 2023
Date: