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

**THE FINAL REPORT OF ENVIRONMENTAL IMPACT ASSESSMENT & ENVIRONMENTAL MANAGEMENT PROGRAMME**

MURARA
ENVIRONMENTAL CONSULTANTS (PTY) LTD

# FINAL BASIC ASSESSMENT REPORT OF A MINING PERMIT APPLICATION FOR THE MINING OF IRON ORE AND MANGANESE IN CERTAIN PART OF PORTION 01 OF THE FARM GOEDGEDACHT 27 IQ: SITUATED IN MAGISTERIAL DISTRICT OF VENTERDORP.

**SAMRAD REF NUMBER: NW30/5/1/3/2/11143 MP**

| | |
|---|---|
| **REPORT PREPARED FOR** | Gono Mining Corporation (Pty)Ltd |
| **PREPARED BY** | Murara Environmental Consultants (Pty) Ltd |
| **E-MAIL** | muraraec@gmail.com |
| **TEL NO** | 064 954 8869 |

## PART A

## SCOPE OF ASSESSMENT AND BASIC ASSESSMENT REPORT

### (A) Details of the EAP-

### b) Who prepared the report;

| Name of Practitioner | Qualifications | Contact details |
|---|---|---|
| Nephawe Mbavhalelo | Masters in Environmental Sciences in University of Venda<br><br>(Refer to **Appendix 1**) | 064 954 8869 |
| | National Diploma in Safety Management (UNISA)<br><br>(Refer to **Appendix 1**) | |

### ii) The expertise of the EAP, including curriculum vitae;

Mr Nephawe Mbavhalelo has more than 9 years of experience in environmental related projects.

These projects include:

- Environmental Impacts assessment projects;
- Wetland and land rehabilitation;
- Water use registration and licensing of water users; and

He also has extensive experience in a wide range of environmentally related projects, processes and applications for private, commercial and industrial clients, in addition the EAP has gather enough experience while working in various Provincial and National government Departments. He has gained experience through his involvement in mining related projects.

**B) The Location of the Activity:**

The proposed activities will be conducted within the certain part of portion 01 of the Farm Goedgedacht 27 IQ: Situated in Magisterial District of Venterdorp, North West Province.The farm coordinates are as follows:

| Points | Longitude | Latitude |
|---|---|---|
| A | 27.223819 | -26.143330 |
| B | 27.226563 | -26.143415 |
| C | 27.226545 | -26.144990 |
| D | 26.224224 | -26.145002 |

**C) A plan which locates the proposed activity or activities applied for as well as associated structures and infrastructure at an appropriate scale;**

A plan of proposed activity and locality map at an appropriate scale is attached in **(Appendix 2).**

**D) A description of the scope for proposed activity, including-**

**(i)** All listed and specified activities triggered

| **NAME OF ACTIVITY**<br><br>**(E.g. For mining permit - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route 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.)** | **Aerial extent of the Activity**<br><br>**Ha or m²** | **LISTED ACTIVITY**<br><br>**(Mark with an X where applicable or affected).** | **WASTE MANAGEMENT AUTHORISATION**<br><br>**(Indicate whether an authorization is required in terms of the Waste Management Act).**<br><br>**(Mark with an X)** |
|---|---|---|---|

| | | | |
|---|---|---|---|
| The following activities will be conducted; which are as follows: Excavation of five (5) trenches; site camp will be established with mobile ablution facility, mobile site office and waste storage facilities will also be established. | Out of 4.79 ha only 0.9 ha will be disturbed and general surface rehabilitation will be conducted concurrently. | **X** | **GNR NO. 327**<br><br>**Activity 21**<br><br>Any activity including the operation of that activity which requires a mining permit in terms of section 27 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including associated infrastructure, structures and earthworks directly related to the extraction of a mineral resource, 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). |
| Vegetation clearance | | **X** | **Activity 27**<br><br>The clearance of an area of 1hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for-<br><br>(i) the undertaking of a linear activity; or<br><br>(ii) Maintenance purposes undertaken in accordance with a maintenance management plan. |

| | | | |
|---|---|---|---|
| Storage of waste material | 0.02 ha | **X** | Schedule 1 (Category A) of NEMWA |
| Creation of access road | 300 m | **X** | Not listed |
| General Surface rehabilitation | 0.2ha | **X** | Not listed |

**(ii) A description of the activities to be undertaken including associated structures and infrastructure.**

The overall activities will be mining of Iron Ore and Manganese. Only five (5) trenches will be opened with the size of 10 m x 10 m. The depth of the trenches will be 10 meters with only 01 trench to be opened at a given time. Furthermore, concurrent rehabilitation will be practiced and monitored by appointed environmental officer on a regular base. The existing roads and tracks already traverse the proposed mining site and where practicable, these roads will be used. Water will be supplied to the mining operation from Local Municipality.

**E) A description of the policy and legislative context within which the development is proposed including;**

**i)** An identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that are applicable to this activity and have been considered in the preparation of the report:

- Environmental Impact Assessment (EIA) regulations
- The National Heritage Resources Act (Act No. 25 of 1999)
- Promotion of Administrative Justice Act (Act No.3 Of 2000)
- National Environmental Management: Waste Act (Act No. 59 of 2008)
- Mineral and Petroleum Resources Development Act (Act No. 28 of 2002)
- The National Environmental Management Act (Act No. 107 of 1998
- The Constitution of South Africa (Act No. 108 of 1996)

| Name | Overview | Permits |
|---|---|---|
| Environmental Impact Assessment (EIA) regulations | New regulations have been promulgated in terms of Chapter 5 of NEMA and were published on 08 December 2014 in Government Notice No. R. 985. Development and land use activities which require Environmental Authorisation in terms of the NEMA EIA Regulations, 2014, are in Listing Notice 3 (GG No. R.983, LN3) identified via geographic areas with the intention being that activities only require Environmental Authorisation when located within designated sensitive areas. | General Authorization is required from the Department of Minerals and Energy |
| The National Heritage Resources Act (Act No. 25 of 1999) | Section 34 (1)): 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 South African Heritage Resources Agency (SAHRA), or the responsible provincial resources authority. | Special attention will be given to the identification of possible cultural or heritage resources on site. Heritage resources including archaeological and paleontological sites over 100 years old, graves older than 60 years, structure older than 60 years are protected by the National Heritage Resources Act no 25 of 1999. Therefore, if such resources are found during the mining or development activities, they shall not be disturbed without a permit from the relevant heritage resource Authority, which means that before such sites are disturbed by development it is incumbent on the developer to ensure that a heritage impact assessment is done and the Provincial Heritage |

| | | |
|---|---|---|
| | | Resources Authority and SAHRA must be contacted immediately, and work must stop. |
| Promotion of Administrative Justice Act (Act No.3 Of 2000) | The Promotion of Administrative Justice Act (PAJA) aims to make the administration effective and accountable to people for its actions. It promotes South African citizens' right to just administration. Section 33 of the Constitution guarantees that administrative action will be reasonable, lawful and procedurally fair and it makes sure that people have the right to ask for written reasons when administrative action has a negative impact on them. | The process of public participation will be transparent without any fear or favour and all decision shall be made available to the public |
| National Environmental Management: Waste Act (Act No. 59 of 2008) | In terms of the Waste Act; no person may commence, undertake or conduct a waste management activity except in accordance with:<br>• The requirements or standards determined in terms of the Waste Act for that activity; and a waste management license issued in respect of that activity if a license is required. | The waste produced during the construction and operation and storage thereof is below the minimum threshold specified in the listed activities Category A, B or C. However, the waste produced during construction should be disposed of at the registered municipality landfill. |
| Mineral and Petroleum Resources Development Act (Act No. 28 of 2002) | This legislation is designed in making provision for equitable access to and sustainable development of the nation's mineral and petroleum resources; and to provide for matters connected therewith. | General Authorization is required from the Department of Minerals and Energy. |

**F. Motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location.**

The primary use of iron ore is to make steel and is the most widely used of all metals. Manganese is used to produce a variety of important alloys and to deoxidize steel and desulfurize. It is also used in dry cell batteries. Manganese is used as a black-brown pigment in paint. It is an essential trace element for living creatures. Despite the slow economic recovery from the 2008 economic recession, there is still a high demand for both minerals.

The potential benefits of the proposed project are:

- Long-term, national benefits of reliable Manganese and iron ore supply and the resultant socio-economic benefits.
- Key contributions include employment and procurement of goods and services in remote communities, social programs, payment of taxes and royalties to governments, investments] in infrastructure and the distribution of profits to public and private shareholders
- Needed job creation and other Local, Provincial and National Socio-Economic benefits.
- Local growth in the economy of and surrounding areas, and for local businesses including those that supply, transport etc.
- Economic benefits for contractors and other suppliers of goods and services. The activity is needed and desirable in South Africa as there is abundance of Manganese and iron ore in the proposed area.
- This has potential in the generation of income for local government thereby directly contributing to its economy and economy of the country.

**G) Motivation for the preferred development footprint within the approved site including a full description of the process followed to reach the proposed development footprint within the approved site.**

The preferred activity is the mining of Manganese and iron ore. After thorough desktop study, the applicant concluded that there is availability of Manganese and iron ore on the proposed area specifically at Goedgedacht 27 IQ.

**Technology alternatives**

There are various mining technologies used within mining industry e.g., Open cast mining method, long wall mining, board and pillar mining, nevertheless open cast mining methods have been selected as the best preferred method.

**No Go Option**

Gono Mining Corporation (Pty) Ltd intends on mining the proposed area. Should it be determined that proposed mining area has economic value, mining operations will contribute to job creation within the Ventersdorp area. Mining operations will also assist with the establishment of small/medium businesses, infrastructure development, community development and poverty eradication in the surrounding previously disadvantaged communities. The applicant envisaged that the applied minerals might be present on this property and therefore is applying for a mining permit.

**H) A full description of the process followed to reach the proposed development footprint within the approved site, including:**

**i. Details of all alternatives considered.**

After several consultations between the specialists, the developer and investors, it is concluded that there is high probability of Iron Ore and Manganese Ore occurring within the farm and therefore applicant would like to commence with the mining activities after competent authority approved the application.

**ii. Details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs.**

**<u>Advertisement and Notices</u>**

**1. <u>Newspaper advertisement</u>**

An advertisement has been placed in English at the local newspaper (Platinum Weekly) on the **27 January 2023** notifying the public of the EIA process and requesting Interested and Affected Parties (I&APs) to register with and submit their comments to Murara Environmental Consultants Pty Ltd. I&APs have been given the opportunity to raise comments within 30 days after the advertisement released (**see appendix 3**).

## 2. Site notices

Site notices have been placed as anticipated on site in English to inform surrounding communities and immediately adjacent landowners about the proposed project. The site notices placed on the **26 January 2023** and I&Aps have been given the opportunity to raise comments within the specified timeframes, **see the appendix 3.**

## 3. Direct notification and circulation of Basic Assessment Report to identified I&Aps

Identified I&APs, including key stakeholders representing various sectors have been directly informed of the proposed development and, the availability of the **Basic Assessment Report** via registered post on **27 January 2023** and were requested to submit comments by email.

The hard copies also made available to the various stakeholders. The following stakeholders were also consulted:

- Department of Economic Development, Environment, Conservation and Tourism
- Department of Water & Sanitation (DWS)
- Department of Mineral Resource and Energy
- Northwest Department of Agriculture
- Provincial Heritage Resources Agency (PHRA), Northwest
- Municipal Manager at the Bojanala Local Municipality
- Ward Councilor
- Department of Rural Development and Land reform

It is expected from I&APs to provide their inputs and comments within 30 days after receipt of the notification or Basic Assessment Report and EMPr. When the comment period ended, all comments received will be included in the final Basic Assessment Report & EMPr and submitted to the competent authority.

**iii.SUMMARY OF ISSUES RAISED BY I&APS**

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

| **Interested and Affected Parties**<br><br>**List the names of persons consulted in this column, and**<br><br>**Mark with an X where those who must be consulted were in fact consulted.** | | **Issues raised** | **EAPs response to issues as mandated by the applicant** | **Section and paragraph reference in this report where the issue and or response where incorporated** |
|---|---|---|---|---|
| **Organization** | **Contact person** | | | |
| **Landowner** | | | | |
| 1. Jupie Kluyts Trust (portion 1) | Kluyts Jacob Francois | Not yet available | Not yet available | The applicant will engage the Landowner regarding the proposed project. |

| | | | | |
|---|---|---|---|---|
| 2. Goedgedacht – FJIM CC (Portion 2) | Mostert Johan Wilhelm | Not yet available | Not yet available | The applicant will engage the Landowner regarding the proposed project. |
| 3. Grand select 153 CC (Portion 3) | Joubert David Hercules | Not yet available | Not yet available | The applicant will engage the Landowner regarding to the proposed project. |
| **The Municipality in which jurisdiction the development is located** | | | | |
| JB Marks Local Municipality | Municipal Manager | Not yet available | Not yet available | Not yet available |
| Dr Kenneth Kaunda District Municipality | Municipal Manager | Not yet available | Not yet available | Not yet available |
| **Municipal councilor of the ward in which the site is located** | | | | |

| | | | | |
|---|---|---|---|---|
| Ward Councilor | Ward Councilor | Not yet available | No yet available | Not yet available |
| **Organs of state having jurisdiction** | | | | |
| The Department of Water & Sanitation (DWS) | Theunissen Cornia | The application has been acknowledged on the 01 February 2023 | Formal comments are not yet available | Appendix 4 |
| Department of Economic Development, Environment, Conservation and Tourism | Lebo Diale and Ellis Thebe | • Project scope must be amanded<br>• Include locality and sensetive map<br>• Adress the issue of high sensitivity interms of aquatic and terrestrial themes as per screening tool<br>• Should the project require water from borehole or any water course | The scope of the project has been revised and amanded<br>The map has been attached see **appendix 3**<br>The matter have been adressed as per request on the page 52<br>On the BAR it has been indicated that borehole will be drilled, however water supply will be | Section D<br>**appendix 3**<br>Page 52<br>Page 6 |

| | | | | |
|---|---|---|---|---|
| | | license must be applied for | supplied from municipality by tanks | |
| Department of Mineral Resource and Energy | Mr D Makamu | Comments has been sent to EAP on the letter dated 24th March 2023. | All comments has been addressed and incorporated into the Basic Assement Report and EMPr. | Appendix 4 |

**(IV) The environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects.**

The application area is situated in Magisterial District of Venterdorp, North West Province.

- **Description of the biological environment**

The proposed prospecting area falls under Carletonville Dolomite Grassland (Gh15). The area is composed mainly of species rich grasslands forming a complex mosaic pattern dominated many species. The important taxa include; Graminoids: *Aristida congesta, Brachiarida serrata, Cynodon dactylon, Digitaria tricholaenoids, Diheteropogon amplectens, Eragrostis chloromelas, E racemose, Heteropgon contortus, Loudetia simplex, Schizachyrium sanguineum, Setaria sphacelata, Themenda trianda, Alloteropsis semialata subsp, Aristida canescens, Aristida diffusa, Bewsia biflora* etc. The area also consists of endemic succulent shrub: *Delosperma davyi, Euclea undulata, Rhus magalismontanum, Zanthoxylum capense and Diospyros lycioides.*

- **Conservation status**

The area is considered vulnerable with target of 24%. The proposed project is adjacent to Somerville private nature reserve. Small extent conserved in statutory reserves (Sterkfontein Caves—part of the Cradle of Humankind World Heritage Site, Oog Van Malmanie, Abe Bailey, Boskop Dam, Schoonspruit, Krugersdorp, Olifantsvlei, Groenkloof) and in at least six private conservation areas. Almost a quarter already transformed for cultivation, by urban sprawl. Erosion very low (84%) and low (15%) (Mucina & Rutherford, 2006).

According to the screening tool report shows the following sensitive themes;

- Aquatic biodiversity- very high sensitive
- Terrestrial- very high sensitive
- Palaeontology- very high sensitive
- Animal species- high sensitive
- Agricultural- high sensitive
- Plant species- low sensitive
- Archaeological and cultural heritage-low sensitive

It should be noted that during desktop study using GIS, no waterbodies has been identified specifically in this portion of mining permit.

- **Archaeological and cultural heritage theme**

According to screening tool report, the area shows low sensitivity in terms of archaeological and cultural heritage, however should any materials discovered, the applicant must immediately cease the mining activities and report to the relevant competent authority.

- **Geology and topography**

Manganese and Iron ore minerals of the Lichtenburg – Ventersdorp area occur mainly as sinuous ridges or 'runs' and in isolated sinkholes that occur almost entirely on a flat to very gently 6 southward sloping surfaces developed on chert-rich and chert-poor formations of the Malmani Subgroup dolomites of the Transvaal Supergroup. The topography of the application area comprises of, and undulating slopes dissected by prominent rocky chert ridges. The Ventersdorp rifting lasted about 50 million years, beginning with the eruption of the Klipriviersberg Group basalts at about 2714 ± 8 Ma (Armstrong et al., 1991).

The proposed mining area falls under Carletonville dolomite grassland (Gh 15). The dolomite surface is overlain by basal Rooihoogte formation breccias, followed by quartzites and conglomerates of the Timeball Hill and Boshoek Formations, and Hekpoort Formation volcanics, all part of the Pretoria Group. These are preserved to the north of the dolomites as east-west orientated ridges decreasing in elevation into the Bushveld Basin. On the south of the Lichtenburg – Ventersdorp area, the Malmani dolomites overlie the Black Reef Formation, at the base of the Transvaal Supergroup, and further south are Ventersdorp and Witwatersrand Supergroups rocks, respectively.

They occur from close to Randfontein in the east to midway between Lichtenburg, Venterdorp and Mahikeng, over an area of approximately150 km (east-west) by 40 km (north-south). In the west, around Lichtenburg, the runs are orientated northeast-southwest; in the central part, near Ventersdorp, they are almost north-south; and close to Randfontein west-northwest east-southeast. Reworked or younger gravels occur to the south along the Mooi River as terraces, and as a palaeochannel to the southwest near Mahikeng.

- **Climate**

The study area is situated within the summer rainfall region of South Africa and within the medium rainfall band of 600+ mm to 800 mm per annum. The general climate of the study site is similar to that of Pretoria. Climatic registers show that Pretoria normally receives about 573 mm of rain per year, with most rainfall occurring during summer. The area normally receives the lowest rainfall (0 mm) in June and the highest (110 mm) in January. The average midday temperatures for Pretoria range from 18,3 °C in June, to 27,5 °C in January. The region is the coldest during July when temperatures drop on average to around 1,7 °C during the night. Frost is not uncommon in the area of the study site during the cold, winter months, but not frequent (www.saexplorer.co.za). The prospecting area is situated within the temperate interior climatic zone, but relatively close to the cold interior zone of South Africa.

- **Economic Aspect**

The potential benefits of the proposed project are:

- Long-term, national benefits of reliable Manganese, Gold and iron ore supply and the resultant socio-economic benefits.
- Key contributions include employment and procurement of goods and services in remote communities, social programs, payment of taxes and royalties to governments, investments] in infrastructure and the distribution of profits to public and private shareholders
- Needed job creation and other Local, Provincial and National Socio-Economic benefits.
- Local growth in the economy of and surrounding areas, and for local businesses including those that supply, transport etc.
- Economic benefits for contractors and other suppliers of goods and services. The activity is needed and desirable in South Africa as there is abundance of Manganese and iron ore in the proposed area.
- This has potential in the generation of income for local government thereby directly contributing to its economy and economy of the country.

**v) The impacts and risks identified for each alternative, including the nature, significance, consequences, extent, duration, and probability of the impacts including the degree to which these impacts;**

**(a) Can be reversed;**

**(b) May cause irreplaceable loss of resources; and**

**(c) Can be avoided, managed or mitigated;**

**Significance of potential impacts**

The following sections present the outcome of the significance rating implementation. The results suggest that the mining activities will have a minimal impact on the natural vegetation and the agricultural activities.

**Pre-Construction Phase**

***Direct impacts:*** During this phase, minor negative impacts are foreseen over the short term. The site preparation may result in the temporary loss or fragmentation of indigenous natural fauna and flora, loss or fragmentation of habitats, minimal soil erosion, heritage, hydrology, and temporary noise disturbance, generation of waste, and risk to safety of livestock, and increased risk of veld fires. The abovementioned impacts are discussed in more detail below:

- **Destruction or fragmentation of habitats**

It is noted that the proposed mining site is mostly covered in natural vegetation. Faunal species will primarily be affected due to loss of habitat, which in this case will be minimal.

| **Loss or fragmentation of habitats** | **Pre-mitigation impact rating** | **Post mitigation impact rating** |
|---|---|---|
| Status (positive or negative) | Negative | Negative |
| Extent | Site (1) | Site (1) |
| Probability | Definite (4) | Probable (3) |

| | | |
|---|---|---|
| Duration | Long term (3) | Long term (3) |
| Magnitude | Medium (2) | Medium (2) |
| Reversibility | Partly reversible (2) | Completely reversible (1) |
| Irreplaceable loss of resources | Significant loss of resource (3) | Marginal loss of resource (2) |
| Cumulative impact | Medium cumulative impacts (3) | |
| **Significance** | **Negative low (32)** | **Negative low (26)** |
| Can impacts be mitigated? | The impact can be mitigated and the person responsible to the environmental management must make sure that no alien invasive species are being introduced to the mining area. | |

- **Increase in vehicle traffic**

The movement of heavy vehicles during the clearance of vegetation and topsoil has the potential to damage local farm roads and create dust and safety impacts for other road users in the area. The volume of traffic along this road is low to medium and the movement of heavy vehicles along this road is likely to damage the road surface and impact on other road users.

| **Increase in vehicle traffic** | **Pre-mitigation impact rating** | **Post mitigation impact rating** |
|---|---|---|
| Status (positive or negative) | Negative | Negative |
| Extent | Local (2) | Site (1) |
| Probability | Probable (3) | Possible (2) |
| Duration | Medium term (2) | Medium term (2) |
| Magnitude | High (3) | Medium (2) |
| Reversibility | Completely reversible (1) | Completely reversible (1) |
| Irreplaceable loss of resources | No loss of resource (1) | No loss of resource (1) |
| Cumulative impact | Medium cumulative impact (3). If damage to roads is not repaired, then this will affect the farming activities in the area and result in higher maintenance costs for vehicles of local | |

| | | |
|---|---|---|
| | farmers and other road users. The costs will be borne by road users who were no responsible for the damage. There will be also an improvement on the gravel road as it is badly damaged. | |
| **Significance** | **Negative medium impacts (36)** | **Negative low (20)** |
| Can impacts be mitigated? | The potential impacts associated with heavy vehicles can be effectively mitigated. The mitigation measures include:<br>• The contractor must ensure that damage caused by construction on the off gravel roads. The costs associated with the repair must be borne by the contractor;<br>• Dust suppression measures must be implemented for heavy vehicles such as wetting of gravel roads on a regular basis and ensuring that vehicles used to transport sand and building materials are fitted with tarpaulins or covers;<br>• All vehicles must be road-worthy and drivers must be qualified and made aware of the potential road safety issues and need for strict speed limits. | |

- **<u>Temporary noise disturbance</u>**

  The generation of noise over a period of months will occur due to preparation of the mining activity. There will be noise coming from machinery, people and vehicles. The noise impact is unlikely to be significant; but activities should be limited to normal working days and hours (6:00 – 17:30).

| **Temporary noise disturbance** | **Pre-mitigation impact rating** | **Post mitigation impact rating** |
|---|---|---|
| Status (positive or negative) | Negative | Negative |
| Extent | Local (2) | Local (2) |

| | | |
|---|---|---|
| Probability | Definite (4) | Probable (3) |
| Duration | Medium term (1) | Medium term (1) |
| Magnitude | Medium (2) | Low (1) |
| Reversibility | Completely reversible (1) | Completely reversible (1) |
| Irreplaceable loss of resources | No loss of resource (1) | No loss of resource (1) |
| Cumulative impact | Low cumulative impact (2). | |
| **Significance** | **Negative low (22)** | **Negative low (10)** |
| Can impacts be mitigated? | The mitigation measures can be implemented related to noise pollution. | |

- **<u>Loss, destruction or fragmentation of indigenous natural fauna and flora:</u>**

  According to the Mucina, L and Rutherford, M.C. (eds) 2006, the proposed mining area is vulnerable and it falls within Carletonville Dolomite Grassland **(Gh 15)** Situated in the North West Province.

| **Loss or fragmentation of indigenous natural fauna and flora** | **Pre-mitigation impact rating** | **Post mitigation impact rating** |
|---|---|---|
| Status (positive or negative) | Negative | Negative |
| Extent | Local (1) | Local (1) |
| Probability | Definite (4) | Possible (2) |
| Duration | Long-term (3) | Long-term (3) |
| Magnitude | Medium (3) | Medium (2) |
| Reversibility | Partly reversible (2) | Partly reversible (2) |
| Irreplaceable loss of resources | Significant loss of resource (3) | Marginal loss of resource (2) |
| Cumulative impact | Medium cumulative impacts (3) | |
| **Significance** | **Negative medium (48)** | **Negative low (26)** |
| Can impacts be mitigated? | The potential impacts associated with this should be effectively mitigated. The aspects that should be covered include: | |

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| | • The footprint associated with the construction related activities (access roads, construction platforms, workshop etc.) should be confined to the fenced off area and minimized where possible;<br>• All areas disturbed by construction related activities, such as upgrading of the access roads on the site, construction platforms, workshop area etc., should be rehabilitated at the end of the construction phase;<br>• The implementation of a rehabilitation programme should be included in the terms of reference for the contractor/s appointed. Specifications for the rehabilitation area provided throughout the EMPr – section (f) of the EMPr. |

- **Loss <u>Loss of topsoil</u>**

  Topsoil may be lost due to poor topsoil management during construction related soil profile disturbance.

| **Loss of topsoil** | **Pre-mitigation impact rating** | **Post mitigation impact rating** |
|---|---|---|
| Status (positive or negative) | Negative | Negative |
| Geographical extent | Local (2) | Site (1) |
| Probability | Possible (2) | Unlikely (1) |
| Duration | Long term (3) | Short term (1) |
| Magnitude | High (3) | Medium (2) |
| Reversibility | Barely reversible (3) | Partly reversible (2) |
| Irreplaceable loss of resources | Significant (3) | Marginal (2) |
| Cumulative impact | Medium cumulative impacts (3) | |
| **Significance** | **Negative medium (48)** | **Negative low (20)** |

| | |
|---|---|
| Can impacts be mitigated? | The following mitigation measures are provided:<br><br>• If an activity will mechanically disturb below surface in any way, then any available topsoil should first be stripped from the entire surface and stockpiled for re-spreading during rehabilitation.<br>• Topsoil stockpiles must be conserved against losses through erosion by establishing vegetation cover on them.<br>• Dispose of all subsurface spoils from excavations where they will not impact on undisturbed land.<br>• During rehabilitation, the stockpiled topsoil must be evenly spread over the entire disturbed surface.<br>• Erosion must be controlled where necessary on top soiled areas. |

- **Generation of waste**

  The workers on site are likely to generate general waste such as packaging, food wastes, bottles etc. Construction waste is likely to consist of packaging, cement and scrap metals etc. The applicant will need to ensure that general and construction waste is appropriately disposed of i.e., taken to the nearest licensed landfill. Sufficient ablution facilities will have to be provided, in the form of portable toilets. No pit latrines, French drain systems or soak away systems shall be allowed.

| **Generation of waste** | **Pre-mitigation impact rating** | **Post mitigation impact rating** |
|---|---|---|
| Status (positive or negative) | Negative | Negative |
| Extent | Local/district (2) | Local/district (2) |
| Probability | Definite (4) | Definite (4) |
| Duration | Medium term (1) | Medium term (1) |
| Magnitude | Medium (2) | Low (1) |

| | | |
|---|---|---|
| Reversibility | Partly reversible (2) | Partly reversible (2) |
| Irreplaceable loss of resources | No loss of resource (1) | No loss of resource (1) |
| Cumulative impact | Medium cumulative impact (3) - An additional demand for landfill space could result in significant cumulative impacts if services become unstable or unavailable, which in turn would negatively impact on the local community. | |
| **Significance** | **Negative medium (26)** | **Negative low (13)** |
| Can impacts be mitigated? | Yes, it is therefore important that all management actions and mitigation measures included in section (f) of the EMPr are implemented. | |

- **Impacts on heritage objects**

  Special attention will be given to the identification of possible cultural or heritage resources on site. Heritage resources including archaeological and paleontological sites over 100 years old, graves older than 60 years, structure older than 60 years are protected by the National Heritage Resources Act no 25 of 1999. Therefore, if such resources are found during the mining or development activities, they shall not be disturbed without a permit from the relevant heritage resource Authority, which means that before such sites are disturbed by development it is incumbent on the developer to ensure that a heritage impact assessment is done and the Provincial Heritage Resources Authority and SAHRA must be contacted immediately and work must stop.

| **Impacts on heritage objects** | **Pre-mitigation impact rating** | **Post mitigation impact rating** |
|---|---|---|
| Status (positive or negative) | Negative | Negative |
| Extent | Local (2) | Local (2) |
| Probability | Possible (2) | Possible (2) |
| Duration | Short term (1) | Short term (1) |
| Magnitude | Very high (4) | High (3) |
| Reversibility | Irreversible (4) | Irreversible (4) |
| Irreplaceable loss of resources | Significant loss of resources (3) | No loss of resource (1) |

| | | |
|---|---|---|
| Cumulative impact | The impact would result in negligible to no cumulative effects (1). | |
| **Significance** | **Negative high (52)** | **Negative medium (33)** |
| Can impacts be mitigated? | If archaeological sites or graves are exposed during construction work, it should immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made. | |

- **<u>Increased risk of veld fires</u>**

The presence of construction workers and construction-related activities on the site poses an increased risk of grass fires that could in turn pose a threat to livestock, crops, wildlife, farmsteads, and the communities in the area. In the process, infrastructure may also be damaged or destroyed and human lives threatened. The potential risk of grass fires was heightened by the windy conditions in the area, especially during the dry, windy winter months from May to October. In terms of potential mitigation measures, a fire-break should be constructed around the perimeter of the site prior to the commencement of the construction phase. In addition, fire-fighting equipment should be provided on site during the construction phase.

| **Increased risk of veld fires** | **Pre-mitigation impact rating** | **Post mitigation impact rating** |
|---|---|---|
| Status (positive or negative) | Negative | Negative |
| Extent | Region (3) | Local (2) |
| Probability | Probable (3) | Possible (2) |
| Duration | Medium term (2) | Medium term (2) |
| Magnitude | Very high (4) | Low (1) |
| Reversibility | Partly reversible (2) | Completely reversible (1) |
| Irreplaceable loss of resources | Significant loss of resource (3) | Marginal loss of resource (2) |
| Cumulative impact | Negligible cumulative effects (1), provided losses are compensated for. | |
| **Significance** | **Negative medium (56)** | **Negative low (10)** |

| | |
|---|---|
| Can impacts be mitigated? | The mitigation measures include:<br><br>• A fire-break should be constructed around the perimeter of the site prior to the commencement of the construction phase;<br>• Contractor should ensure that open fires on the site for cooking or heating are not allowed except in designated areas;<br>• Contractor to ensure that construction related activities that pose a potential fire risk, such as welding, are properly managed and are confined to areas where the risk of fires has been reduced. Measures to reduce the risk of fires include avoiding working in high wind conditions when the risk of fires is greater. In this regard special care should be taken during the high risk dry, windy winter months;<br>• Contractor to provide must adequate firefighting equipment on-site, including a fire fighting vehicle;<br>• Contractor to provide fire-fighting training to selected construction staff;<br>• No construction staff, with the exception of security staff, to be accommodated on site over night;<br>• As per the conditions of the Code of Conduct, in the advent of a fire being caused by construction workers and or construction activities, the appointed contractors must compensate farmers for any damage caused to their farms. The contractor should also compensate the firefighting costs borne by farmers and local authorities. |

**Operational/construction Phase**

***Direct impacts:*** During the operational phase the study area will serve as mining area and the impacts are generally associated with soil erosion, change in land use, impacts associated with increase in storm water runoff, increased consumption of water and the

generation of general waste, Potential impact on tourism and noise disturbance. The operational phase will also have a direct positive impact through the provision of permanent employment opportunities and facilitating a positive economic growth. The abovementioned impacts are discussed in detail below:

- **Soil erosion**

  The largest risk factor for soil erosion will be during the operational phase when doing mining activities ensues and soil is left bare until rehabilitation is initiated. Erosion will be localized within the site. This exposes the top layer of the soil into runoff during the heavy winds and rainfall threatening to wash away more fertile soils. This will ultimately lead to the irretrievable commitment of this resource. The measurable effect of reducing erosion by utilizing mitigation measures may reduce possible erosion significantly.

| **Soil erosion** | | **Pre-mitigation impact rating** | **Post mitigation impact rating** |
|---|---|---|---|
| Status (positive or negative) | | Negative | Negative |
| Extent | | Local (2) | Site (1) |
| Probability | | Probable (3) | Possible (2) |
| Duration | | Medium term (2) | Medium term (2) |
| Magnitude | | Medium (2) | Low (1) |
| Reversibility | | Partly reversible (2) | Partly reversible (2) |
| Irreplaceable loss of resources | | Marginal loss of resource (2) | Marginal loss of resource (2) |
| Cumulative impact | | Low cumulative effects (2), should these impacts occur, there will be a cumulative impact on the air and water resources in the study area in terms of pollution. | |
| **Significance** | | **Negative medium (26)** | **Negative Low (11)** |
| Can impacts be mitigated? | | Yes, to avoid soil erosion it will be a good practice to not remove all the vegetation at once but to only clear the to be mined at the time, then remediated and then move to another area. | |

| | | |
|---|---|---|
| | | • The following mitigation or management measures are provided: Implement an effective system of run-off control, where it is required, that collects and safely disseminates run-off water from all hardened surfaces and prevents potential down slope erosion.<br>• Monitor area frequently after heavy rainfall to determine where erosion may be initiated and mitigate by modifying the soil micro-topography and re-vegetation or soil erosion control efforts accordingly |

- **Change in land-use**

  The proposed area will still be used for mining.

| **Change in land use** | **Pre-mitigation impact rating** | **Post mitigation impact rating** |
|---|---|---|
| Status (positive or negative) | Negative | Negative |
| Extent | Local (2) | Local (2) |
| Probability | Possible (2) | Possible (2) |
| Duration | Medium term (2) | Medium term (2) |
| Magnitude | Medium (2) | Medium (2) |
| Reversibility | Completely reversible (1) | Completely reversible (1) |
| Irreplaceable loss of resources | Marginal loss of resource (2) | Marginal loss of resource (2) |
| Cumulative impact | Low cumulative effects (2) | |
| **Significance** | **Negative medium (22)** | **Negative low (22)** |
| Can impacts be mitigated? | The applicant should establish a Rehabilitation Fund to be used for rehabilitating the area once the proposed facility has been decommissioned. The fund should be funded by revenue generated during the operational phase of the project. | |

- **Generation of alternative land use income**

Income generated through the mining of Manganese and iron ore will boost the economy of the area and improve the rural livelihood.

| Generation of alternative land use income | Pre-mitigation impact rating | Post mitigation impact rating |
|---|---|---|
| Status (positive or negative) | Positive | Positive |
| Geographical extent | Site (1) | Local (2) |
| Probability | Definite (4) | Definite (4) |
| Duration | Long term (3) | Long term (3) |
| Magnitude | Medium (2) | Medium (2) |
| Reversibility | Completely reversible (1) | Completely reversible (1) |
| Irreplaceable loss of resources | No loss of resources (1) | No loss of resources (1) |
| Cumulative impact | Low cumulative impact (2). | |
| **Significance** | **Positive Low (24)** | **Positive Low (26)** |
| Can impacts be mitigated? | No mitigation required. | |

- **<u>Increase in storm water runoff</u>**

  The development will potentially result in an increase in storm water run-off that needs to be managed to prevent soil erosion, especially where vegetation will be cleared. Not all the vegetation should be removed at once. Only the specific trench being excavated at the specific time should be cleared.

| Increase in storm water runoff | Pre-mitigation impact rating | Post mitigation impact rating |
|---|---|---|
| Status (positive or negative) | Negative | Negative |
| Extent | Local (2) | Site (1) |
| Probability | Probable (3) | Unlikely (1) |
| Duration | Long term (3) | Medium term (2) |
| Magnitude | Medium (2) | Low (1) |
| Reversibility | Partly reversible (2) | Partly reversible (2) |
| Irreplaceable loss of resources | Significant loss of resource (3) | Marginal loss of resource (2) |

| | | |
|---|---|---|
| Cumulative impact | Medium cumulative impact (3) - Should these impacts occur, there will be cumulative impacts on the wider area. | |
| **Significance** | **Negative medium (32)** | **Negative low (11)** |
| Can impacts be mitigated? | Yes. . Not all the vegetation should be removed at once. Only the specific trench being excavated at the specific time should be cleared. | |

- **Increased consumption of water**

  Additional water requirements related to the portable water supply for employees and workers. Water will also be used for dust suppression.

| **Increased consumption of water** | **Pre-mitigation impact rating** | **Post mitigation impact rating** |
|---|---|---|
| Status (positive or negative) | Negative | Negative |
| Extent | Region (3) | Region (3) |
| Probability | Definite (4) | Definite (4) |
| Duration | Long term (3) | Long term (3) |
| Magnitude | High (3) | Medium (2) |
| Reversibility | Irreversible (4) | Irreversible (4) |
| Irreplaceable loss of resources | Significant loss of resources (3) | Significant loss of resources (3) |
| Cumulative impact | High cumulative impacts (4) - An additional demand on water sources could result in a significant cumulative impact with regards to the availability of water. | |
| **Significance** | **Negative high (63)** | **Negative medium (42)** |
| Can impacts be mitigated? | Yes, management actions and mitigation measures related to the use of water must be implemented. Water must be used for dust suppression and human consumption. | |

- **Generation of waste**

  Approximately 20 Workers sourced from the surrounding villages will be present on site from 6:00 – 17:30, Monday to Saturday. Sources of general waste will be waste food,

packaging, paper, etc. General waste will be stored on the site and removed on a weekly basis by a contractor appointed by the applicant.

| **Generation of waste** | **Pre-mitigation impact rating** | **Post mitigation impact rating** |
|---|---|---|
| Status (positive or negative) | Negative | Negative |
| Extent | Local (2) | Local (2) |
| Probability | Definite (4) | Definite (4) |
| Duration | Long term (3) | Long term (3) |
| Magnitude | Low (1) | Low (1) |
| Reversibility | Partly reversible (2) | Partly reversible (2) |
| Irreplaceable loss of resources | No loss of resource (1) | No loss of resource (1) |
| Cumulative impact | Medium cumulative impact (3) - An additional demand for landfill space could result in significant cumulative impacts with regards to the availability of landfill space. | |
| **Significance** | **Negative low (15)** | **Negative low (15)** |
| Can impacts be mitigated? | Yes, General waste will be stored on the site and removed on a weekly basis by a contractor appointed by the applicant. | |

**Noise disturbance**

The proposed mining activities will result in the generation of noise over a period of 2-3 years. Sources of noise are likely to include vehicles, the use of machinery such as back actors, crushers and screeners and people working on the site; but the mining activities should be limited to normal working days and some Saturdays between hours (6:00 – 17:30).

| **Temporary noise disturbance** | **Pre-mitigation impact rating** | **Post mitigation impact rating** |
|---|---|---|
| Status (positive or negative) | Negative | Negative |

| | | |
|---|---|---|
| Extent | Local (2) | Local (2) |
| Probability | Definite (4) | Possible (2) |
| Duration | Medium term (2) | Medium term (2) |
| Magnitude | Medium (2) | Medium (2) |
| Reversibility | Completely reversible (1) | Completely reversible (1) |
| Irreplaceable loss of resources | No loss of resource (1) | No loss of resource (1) |
| Cumulative impact | The impact would result in negligible to no cumulative effects (1). | |
| **Significance** | **Negative low (22)** | **Negative low (18)** |
| Can impacts be mitigated? | Yes | |

- **Potential impact on tourism**

  The tourism sector is regarded as an important economic sector in the North West province. The tourism potential of the area is linked to the areas natural resources, including the relatively undisturbed scenery and landscape. The impact of the proposed mining of Manganese and iron ore on the areas with mitigation is likely to be low.

| **Potential impacts on tourism** | **Pre-mitigation impact rating** | **Post mitigation impact rating** |
|---|---|---|
| Status (positive or negative) | Negative | Negative |
| Extent | Site (1) | Site (1) |
| Probability | Possible (2) | Possible (2) |
| Duration | Medium term (2) | Medium term (2) |
| Magnitude | medium (2) | Low (1) |
| Reversibility | Completely reversible (1) | Completely reversible (1) |
| Irreplaceable loss of resources | N/A | N/A |
| Cumulative impact | N/A | |

| | | |
|---|---|---|
| **Significance** | **Negative low (12)** | **Negative low (6)** |
| Can impacts be mitigated? | No mitigation required | |

**Decommissioning Phase (Mine Closure and Rehabilitation)**

The physical environment will benefit from the closure of the mining area.

- **Rehabilitation of the physical environment**

  The physical environment will benefit from the closure of the mining area. There is a slight chance to restore the site to its natural state, however rehabilitation will be done concurrently with all activities.

| **Rehabilitation of the physical environment** | **Pre-mitigation impact rating** | **Post mitigation impact rating** |
|---|---|---|
| Status (positive or negative) | Positive | Positive |
| Extent | Site (1) | Site (1) |
| Probability | Definite (4) | Definite (4) |
| Duration | Long term (3) | Long term (3) |
| Magnitude | High (3) | High (3) |
| Reversibility | N/A | N/A |
| Irreplaceable loss of resources | N/A | N/A |
| Cumulative impact | The impact would result in negligible to no cumulative effects (1) | |
| **Significance** | **Negative low (27)** | **Negative low (27)** |
| Can impacts be mitigated? | No mitigation measures required. | |

- **Loss of employment**

  It is likely that number of workers employed during the construction and operational phase, will negatively impacted by the decommissioning of the facility.

| Loss of employment | Pre-mitigation impact rating | Post mitigation impact rating |
|---|---|---|
| Status (positive or negative) | Negative | Negative |
| Extent | Local (2) | Local (2) |
| Probability | Possible (2) | Possible (2) |
| Duration | Medium term (2) | Short term (1) |
| Magnitude | High (3) | Medium (2) |
| Reversibility | Partly reversible (2) | Partly reversible (2) |
| Irreplaceable loss of resources | No loss of resource (1) | No loss of resource (1) |
| Cumulative impact | The impact would result in negligible to no cumulative effects (1) | |
| **Significance** | **Negative medium (30)** | **Negative low (18)** |
| Can impacts be mitigated? | The following mitigation measures are recommended:<br>• Gono Mining Corporation (Pty)Ltd should establish an Environmental Rehabilitation Trust Fund to cover the costs of decommissioning and rehabilitation of disturbed areas.<br>• All structures and infrastructure associated with the proposed facility should be dismantled and transported off-site on decommissioning. | |

**Indirect impacts:** No indirect impacts are anticipated from the decommissioning phase of the proposed development.

**vi) The methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives;**

**Method of environmental assessment**

The environmental assessment aims to identifying various possible environmental impacts which could results from the proposed mining activities. As a result, there is a need to evaluate such impacts in terms of its significance and by doing so it provides the opportunity for most critical issues to be addressed.

Significance-is determined through a synthesis of impact characteristics, which include context and intensity of an impact. Context- refers to the geographical scale i.e. site, local, national or global whereas intensity is defined by the severity of the impact e.g. the magnitude of deviation from background conditions, the size of the area affected, the duration of the impact and the overall probability of occurrence. Significance is calculated as shown in the Table below.

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 total number of points scored for each impact indicates the level of significance of the impact.

**Impact Rating System**

Impact assessment takes into consideration the nature, scale and duration of impacts on the environment whether such impacts are positive or negative. Impact assessed based on the following project phases:

- Construction
- Operation
- Decommissioning

Where necessary, the proposal for mitigation or optimization of an impact should be detailed. A brief discussion of the impact and the rationale behind the assessment of its significance should also be included. The rating system is applied to the potential impacts on the receiving environment and includes an objective evaluation of the mitigation of the impact. In assessing the significance of each impact the following criteria is used:

**Table: The rating system**

| | | |
|---|---|---|
| **NATURE** | | |
| This covers brief description of the impact of environmental parameter that has to be assessed in the context of the project. It includes a brief written statement of the environmental aspect being impacted upon by a particular action or activity. | | |
| **PROBABILITY** | | |
| Defined as the chance of an impact to occur. | | |
| 1 | Unlikely | Chance of the impact occurring is extremely low (Less than a 25% chance of occurrence). |
| 2 | Possible | The impact may occur (Between a 25% to 50% chance of occurrence). |
| 3 | Probable | The impact will likely occur (Between a 50% to 75% chance of occurrence). |
| 4 | Definite | Impact will certainly occur (Greater than a 75% chance of occurrence). |
| **DURATION** | | |
| This describes the duration of the impacts. Duration indicates the lifetime of the impact as a result of the proposed activity. | | |
| 1 | Short term | The impact will either disappear with mitigation or will be mitigated through natural processes in a span shorter than the construction phase (0 – 1 years), or the impact will last for the period of a relatively short construction period and a limited recovery time after construction, thereafter it will be entirely negated (0 – 2 years). |
| 2 | Medium term | The impact will continue or last for some time after the construction phase but will be mitigated by direct human action or by natural processes thereafter (2 – 10 years). |
| 3 | Long term | The impact and its effects will continue or last for the entire operational life of the development, but will be mitigated by direct human action or by natural processes thereafter (10 – 30 years). |

| | | |
|---|---|---|
| 4 | Permanent | The only class of impact that will be non-transitory. Mitigation either by man or natural process will not occur in such a way or such a time span that the impact can be considered indefinite. |
| **INTENSITY/ MAGNITUDE** | | |
| This describes the severity of an impact. | | |
| 1 | Low | Impact affects the quality, use and integrity of the system/component in a way that is barely perceptible. |
| 2 | Medium | Impact changes the quality, use and integrity of the system/component whereas system/component still continues to function in a moderately modified way and maintains general integrity (some impact on integrity). |
| 3 | High | Impact affects the continued viability of the system/ component and the quality, use, integrity and functionality of the system or component is severely impaired and may temporarily cease. High costs of rehabilitation and remediation. |
| 4 | Very high | Impact affects the continued viability of the system/component and the quality, use, integrity and functionality of the system or component permanently ceases and is irreversibly impaired. Rehabilitation and remediation often impossible. If possible rehabilitation and remediation often unfeasible due to extremely high costs of rehabilitation and remediation. |
| **IRREPLACEABLY** | | |
| This describes the degree to which resources will be irreplaceably lost as a result of a proposed activity. | | |
| 1 | No loss of resource | The impact will not result in the loss of any resources. |
| 2 | Marginal loss of resource | The impact will result in marginal loss of resources. |

| | | |
|---|---|---|
| 3 | Significant loss of resources | The impact will result in significant loss of resources. |
| 4 | Complete loss of resources | The impact is result in a complete loss of all resources. |
| **REVERSIBILITY** | | |
| This describes the degree to which an impact can be successfully reversed upon completion of the proposed activity. | | |
| 1 | Completely reversible | The impact is reversible with implementation of minor mitigation measures. |
| 2 | Partly reversible | The impact is partly reversible but more intense mitigation measures are required. |
| 3 | Barely reversible | The impact is unlikely to be reversed even with intense mitigation measures. |
| 4 | Irreversible | The impact is irreversible and no mitigation measures exist. |
| **CUMULATIVE EFFECT** | | |
| It describes the cumulative effect of the impacts. A cumulative impact is an effect which on its own may not be significant but become significant if added to other existing or potential impacts emanating from other similar or diverse activities as a result of the project activity in question. | | |
| 1 | Negligible cumulative impact | The impact would result in negligible to no cumulative effects. |
| 2 | Low cumulative impact | The impact would result in insignificant cumulative effects. |
| 3 | Medium cumulative impact | The impact would result in minor cumulative effects. |
| 4 | High cumulative impact | The impact would result in significant cumulative effects |

| 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 calculation of the significance of an impact uses the following formula: (Extent + probability + reversibility + irreplaceability + duration + cumulative effect) x magnitude/intensity.<br><br>The summation of the different criteria will produce a non-weighted value. By multiplying this value with the magnitude/intensity, the resultant value acquires a weighted characteristic which can be measured and assigned a significance rating. | | |
| Points | Impact significance rating | Description |
| 6 to 28 | Negative low impact | The anticipated impact will have negligible negative effects and will require little to no mitigation. |
| 6 to 28 | Positive low impact | The anticipated impact will have minor positive effects. |
| 29 to 50 | Negative medium impact | The anticipated impact will have moderate negative effects and will require moderate mitigation measures. |
| 29 to 50 | Positive medium impact | The anticipated impact will have moderate positive effects. |
| 51 to 73 | Negative high impact | The anticipated impact will have significant effects and will require significant mitigation measures to achieve an acceptable level of impact. |
| 51 to 73 | Positive high impact | The anticipated impact will have significant positive effects. |
| 74 to 96 | Negative very high impact | The anticipated impact will have highly significant effects and are unlikely to be able to be mitigated adequately. These impacts could be considered "fatal flaws". |
| 74 to 96 | Positive very high impact | The anticipated impact will have highly significant positive effects. |

**(vii) Positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;**

- Increased noise levels resulting from mining activities and increased traffic movement during all operational phases.
- Potential water and soil pollution impacts resulting from hydrocarbon spills and soil erosion which may impact on environmental resources utilized by communities, landowners and other stakeholders.
- Potential water and soil pollution impacts resulting from hydrocarbon spills and soil erosion which may impact on ecosystem functioning.
- Potential decrease in water levels due to abstraction.
- Increased vehicle activity with in the area resulting in the possible destruction and disturbance of fauna and flora.
- Poor access control to farms which may impact on livestock movement, breeding and grazing practices.
- Influx of persons (job seekers) to site as a result of increased activity and the possible resultant increase in opportunistic crime.
- Potential visual impacts caused by operational activities.

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

Negative impacts on vegetation, soil and the water resources associated with the mining activity have been identified through the BAR & EMPr process. Mitigation measures as set out in the Environmental Management Programme (EMPr) and must be implemented in order to minimize these potential impacts.

- Noise

Site activities must take place during the day (06:00 – 17:30) to avoid night time noise disturbances and night time collisions with fauna.

- Visual impact

Dust suppression measures must be implemented.

- Soil

Disturbances to soil should be limited as far as possible.

- Topsoil should be stockpiled in a proper manor and no alien invasive species should be allowed to grow on the stockpiles. Should alien invasive species identified, remedial action must be undertaken to prevent further development of such species.
- Erosion control measures should be implemented where necessary.
- Oils and lubricants must be stored in lined containment structures.
- Drip trays should be used where necessary.
- Waste bins should be provided and waste should be removed and disposed of at a licensed landfill site.
- Rehabilitation should be done concurrently.

➢ Water

- Erosion control measures should be implemented if necessary.
- Before any water is abstracted, a geo-hydro study should be conducted to determine the specific yield.
- Oils and lubricants must be stored in lined containment structures.
- Drip trays should be used where necessary.

**ix) <u>Matrix analysis</u>**

The matrix describes the relevant listed activities, the aspects of the development that will apply to the specific listed activity, a description of the environmental issues and potential impacts, the significance and magnitude of the potential impacts, and the mitigation of the potential impacts. The matrix also highlights areas of particular concern, which requires more in depth assessment. Each cell is evaluated individually in terms of the nature of the impact, duration and its significance – should no mitigation measures be applied. This is important since many impacts would not be considered insignificant if proper mitigation measures were implemented. The matrix also provides an indication if mitigation measures are available.

In order to conceptualize the different impacts, the matrix specify the following:

- **Stressor**: Indicates the aspect of the proposed activity, which initiates and cause impacts on elements of the environment.
- **Receptor**: Highlights the recipient and most important components of the environment affected by the stressor.
- **Impacts**: Indicates the net result of the cause-effect between the stressor and receptor.
- **Mitigation**: Impacts need to be mitigated to minimize the effect on the environment.

**x) Motivation where no alternative sites where considered**

Based on the previous studies conducted within the vicinity of the site and desktop study, applicant conclude that there is availability of Iron Ore, Manganese Ore. Furthermore, the probability is very high to encounter more Iron Ore and Manganese Ore.

**xi) A concluding statement indicating the preferred alternatives, including preferred location of the activity;**

The site is preferred due to its possibility of having Manganese and iron ore. This area is also suitable for agriculture and grazing due to the climatic conditions.

**(i) Description of the process undertaken to identify, assess and rank the impacts the activity will impose on the preferred location through the life of the activity, including;**

i) A description of all environmental issues and risks that were identified during the environmental impact assessment process and;
ii) An assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures:

| QUESTION | YES | NO | Un-sure | Description |
|---|---|---|---|---|
| **1. Are any of the following located on the site earmarked for the development?** | | | | |
| I. A river, stream, dam or wetland | | ✕ | | |
| II. A conservation or open space area | | ✕ | | |
| III. An area that is of cultural importance | | | ✕ | |
| IV. Site of geological significance | | | ✕ | |
| V. Areas of outstanding natural beauty | | | ✕ | |
| VI. Highly productive agricultural land | ✕ | | | |
| VII. Floodplain | | ✕ | | |
| VIII. Indigenous Forest | | | ✕ | |
| IX. Grass land | ✕ | | | |
| X. Bird nesting sites | | | ✕ | |
| XI. Red data species | | | ✕ | |
| XII. Tourist resort | | ✕ | | |
| **2. Will the project potentially result in potential?** | | | | |
| I. Removal of people | | ✕ | | |
| II. Visual Impacts | ✕ | | | The visual impact will be managed. |
| III. Noise pollution | ✕ | | | The work of mining will be carried out during the day, and it will not affect surrounding infrastructure and people. |
| IV. Construction of an access road | | ✕ | | Access will be obtained from a gravel road |
| V. Risk to human or valuable ecosystems due to explosion/fire/ discharge of waste into water or air. | | ✕ | | |

| | | | | |
|---|---|---|---|---|
| VI. Accumulation of large workforce (>20 manual workers) into the site. | ✕ | | | Approximately 20 employment opportunities will be created during the construction and operational phase of the project. |
| VII. Utilisation of significant volumes of local raw materials such as water, wood etc. | | | ✕ | The amount of water that will be used, will be verified. |
| VIII. Job creation | ✕ | | | Approximately 20 employment opportunities will be created during the construction and operational phase of the project. |
| IX. Traffic generation | | ✕ | | None. |
| X. Soil erosion | | ✕ | | Only areas earmarked for mining activity will be cleared. The proposed activity will be conducted in phases and the topsoil stockpiled separately. Concurrent rehabilitation will take place. |
| XI. Installation of additional bulk telecommunication transmission lines or facilities | | ✕ | | None. |
| **3. Is the proposed project located near the following?** | | | | |
| I. A river, stream, dam or wetland | ✕ | | | |
| II. A conservation or open space area | ✕ | | | |
| III. An area that is of cultural importance | | | ✕ | |
| IV. A site of geological significance | | | ✕ | |
| V. Highly productive agricultural land | ✕ | | | |
| VI. A tourist resort | | ✕ | | |
| VII. A formal or informal settlement | ✕ | | | The proposed area is situated in Ventersdorp area |

**J. AN ASSESSMENT OF EACH IDENTIFIED POTENTIALLY SIGNIFICANT IMPACT AND RISK**

| LISTED ACTIVITY (The Stressor) | ASPECTS OF THE DEVELOPMENT /ACTIVITY | POTENTIAL IMPACTS | | | SIGNIFICANCE AND MAGNITUDE OF POTENTIAL IMPACTS | | | MITIGATION OF POTENTIAL IMPACTS | SPECIALIST STUDIES / INFORMATION |
|---|---|---|---|---|---|---|---|---|---|
| | | Receptors | | Impact description | Minor | Major | Duration | Possible Mitigation | |
| **CONSTRUCTION PHASE** | | | | | | | | | |
| ***Activity 27***<br><br>*The clearance of an area of 1hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for-*<br><br>*(i) the undertaking of a linear activity; or*<br><br>*(ii) Maintenance purposes undertaken in accordance with a maintenance management plan.*<br><br>***GNR NO. 327*** | Site clearing and preparation.<br><br>Areas earmarked for mining will need to be cleared, topsoil will be stockpiled separately. | BIOPHYSICAL ENVIRONMENT | Fauna & Flora | • Loss or fragmentation of indigenous natural vegetation.<br>• Loss of sensitive species.<br>• Loss or fragmentation of habitats. | - | | M | Yes | - |
| | | | Air | • Air and dust pollution due to the increase of traffic of construction vehicles. | - | | S | Yes | - |
| | | | Soil | • Soil degradation, including erosion.<br>• Loss of topsoil.<br>• Disturbance of soils and existing land use (soil compaction). | | - | S | Yes | - |
| | | | Geology | • It is not foreseen that the removal of indigenous vegetation will impact on the geology or vice versa. | N/A | N/A | N/A | N/A | - |
| | | | Existing services infrastructure | • Generation of waste that need to be accommodated at a licensed landfill site.<br>• Generation of sewage that need to be accommodated by the local sewage plant. | - | | S | Yes | - |
| | | | Ground water | • Pollution due to construction vehicles. | - | | S | Yes | - |
| | | | Surface water | • Increase in storm water run-off.<br>• Pollution of water sources due to soil erosion.<br>• Destruction of watercourses (pans/dams/streams). | - | | S | Yes | - |
| | | SOCIAL/ ECONOMIC | Local unemployment rate | • Job creation.<br>• Business opportunities.<br>• Skills development. | | + | S | Yes | - |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| ***Activity 21***<br><br>*Any activity including the operation of that activity which requires a mining permit in terms of section 27 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including associated infrastructure, structures and earthworks directly related to the extraction of a mineral resource, 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).* | | | Visual landscape | • Potential visual impact on residents of farmsteads and motorists in close proximity to proposed facility. | | - | S | Yes | - |
| | | | Traffic volumes | • Increase in construction vehicles. | - | | S | Yes | - |
| | | | Health & Safety | • Air/dust pollution.<br>• Road safety.<br>• Increased risk of veld fires. | | - | S | Yes | - |
| | | | Noise levels | • The generation of noise as a result of construction vehicles, the use of machinery such as drills, excavators, rotary pans, dumper trucks and people working on the site. | | - | S | Yes | - |
| | | | Tourism industry | • Since there are tourism facilities in close proximity to the site, the construction activities might have an impact on tourism in the area. | - | | M | Yes | - |
| | | | Heritage resources | • Removal or destruction of archaeological and/or paleontological sites.<br>• Removal or destruction of buildings, structures, places and equipment of cultural significance.<br>• Removal or destruction of graves, cemeteries and burial grounds. | - | | S | Yes | - |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | <u>Site clearing and preparation</u><br><br>Areas earmarked for mining will need to be cleared, topsoil will be stockpiled separately. This will inevitably result in the removal of indigenous vegetation located on the site. | BIOPHYSICAL ENVIRONMENT | Fauna & Flora | • Loss or fragmentation of indigenous natural vegetation.<br>• Loss of sensitive species.<br>• Loss or fragmentation of habitats. | - | - | L | Yes | - |
| | | | Air quality | • Air and dust pollution due to the increase of traffic. | - | | L | Yes | - |
| | | | Soil | • Soil degradation, including erosion.<br>• Disturbance of soils and existing land use (soil compaction).<br>• Loss of agricultural potential (low significance relative to agricultural potential of the site). | - | | M | Yes | - |
| | | | Geology | • It is not foreseen that the removal of indigenous vegetation will impact on the geology or vice versa.<br>• Blasting may affect the geology | | - | L | Yes | - |
| | | | Existing services infrastructure | • Generation of waste that need to be accommodated at a licensed landfill site.<br>• Generation of sewage that need to be accommodated by the local sewage plant. | - | | M | Yes | - |
| | | | Ground water | • Pollution due to construction vehicles<br>• Pollution due to blasting | - | | S | Yes | - |
| | | | Surface water | • Increase in storm water run-off.<br>• Pollution of water sources due to soil erosion.<br>• Destruction of watercourses (pans/dams/streams). | - | | M | Yes | - |
| | | SOCIAL/ECONOMIC ENVIRONMENT | Local unemployment rate | • Job creation.<br>• Skills development. | | + | S | N/A | - |
| | | | Visual landscape | • Potential visual impact on visual receptors in close proximity to proposed facility. | | - | M | Yes | - |
| | | | Traffic volumes | • Increase in construction vehicles. | | - | S | Yes | - |
| | | | Health & Safety | • Air/dust pollution.<br>• Road safety. | | - | S | Yes | - |
| | | | Noise levels | • The generation of noise as a result of construction vehicles, and people working on the site. | - | | S | Yes | - |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Tourism industry | • Since there are tourism facilities in close proximity to the site, the construction activities might have an impact on tourism in the area. | - | | M | Yes | - |
| | | | Heritage resources | • Removal or destruction of archaeological and/or paleontological sites.<br>• Removal or destruction of buildings, structures, places and equipment of cultural significance.<br>• Removal or destruction of graves, cemeteries and burial grounds. | - | | S | Yes | - |
| **OPERATIONAL PHASE** | | | | | | | | | |
| | The key components of the proposed project are described below:<br><br>• <u>Supporting Infrastructure</u><br>- A control facility with basic services such as water and electricity will be constructed on the site. Other supporting infrastructure includes a site office and workshop area. | BIOPHYSICAL ENVIRONMENT | Fauna & Flora | • Fragmentation of habitats.<br>• Establishment and spread of declared weeds and alien invader plants (operations). | | - | L | Yes | - |
| | | | Air quality | • Air pollution due to the mining activity, crusher plant, transport of the gravel to the designated areas and possible blasting. | - | - | M | Yes | - |
| | | | Soil | • Soil degradation, including erosion.<br>• Disturbance of soils and existing land use (soil compaction).<br>• Loss of agricultural potential (low significance relative to agricultural potential of the site). | - | | M | Yes | - |
| | | | Geology | • Collapsible soil.<br>• Seepage (shallow water table).<br>• Active soil (high soil heave).<br>• Erodible soil.<br>• The presence of undermined ground.<br>• Instability due to soluble rock.<br>• Steep slopes or areas of unstable natural slopes.<br>• Areas subject to seismic activity.<br>• Areas subject to flooding.<br>• Blasting | | - | L | Yes | - |
| | | | Existing services infrastructure | • Generation of waste that need to be accommodated at a licensed landfill site.<br>• Generation of sewage that need to be accommodated by the municipal sewerage system and the local sewage plant. | | - | M | Yes | - |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | • Roads – Access will be obtained from the existing road.<br>• Fencing - For health, safety and security reasons, the facility will be required to be fenced off from the surrounding farm. | | | • Increased consumption of water. | | | | | |
| | | | Ground water | • Leakage of hazardous materials. The machinery on site require oils and fuel to function. Leakage of these oils and fuels can contaminate water supplies.<br>• Pollution due to blasting | - | | L | Yes | - |
| | | | Surface water | • Increase in storm water runoff. The development will potentially result in an increase in storm water run-off that needs to be managed to prevent soil erosion.<br>• Destruction of watercourses (pans/dams/streams).<br>• Leakage of hazardous materials. The machinery on site require oils and fuel to function. Leakage of these oils and fuels can contaminate water supplies. | - | | L | Yes | - |
| | | SOCIAL/ECONOMIC ENVIRONMENT | Local unemployment rate | • Job creation. Security guards will be required for 24 hours every day of the week and general laborers will also be required for the cleaning of the panels.<br>• Skills development. | | + | L | Yes | - |
| | | | Visual landscape | • The proposed portions are used for livestock grazing which will still take place simultaneously with the mining activity, however this depends on the location of the activity. | - | | L | Yes | - |
| | | | Traffic volumes | • Increase in vehicles collecting gravel for distribution. | - | | S | Yes | - |
| | | | Health & Safety | • Air/dust pollution.<br>• Road safety. | | - | S | Yes | - |
| | | | Noise levels | • The proposed development will result in noise pollution during the operational phase. | | - | M | Yes | - |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Tourism industry | • Since there are tourism facilities in close proximity to the site, the operational activities might have an impact on tourism in the area. | | - | M | Yes | - |
| | | | Heritage resources | • It is not foreseen that the proposed activity will impact on heritage resources or vice versa. | - | | S | Yes | - |
| **DECOMMISSIONING PHASE** | | | | | | | | | |
| | Mine closure<br><br>During the mine closure the Mine and its associated infrastructure will be dismantled.<br><br>Rehabilitation of biophysical environment<br><br>The biophysical environment will be rehabilitated. | BIOPHYSICAL ENVIRONMENT | Fauna & Flora | • Re-vegetation of exposed soil surfaces to ensure no erosion in these areas. | | + | L | Yes | - |
| | | | Air quality | • Air pollution due to the increase of traffic of construction vehicles. | - | | S | Yes | - |
| | | | Soil | • Backfilling of all voids<br>• Placing of topsoil on backfill | | + | L | Yes | - |
| | | | Geology | • It is not foreseen that the decommissioning phase will impact on the geology of the site or vice versa. | N/A | N/A | N/A | N/A | - |
| | | | Existing services infrastructure | • Generation of waste that need to be accommodated at the local landfill site.<br>• Generation of sewage that need to be accommodated by the municipal sewerage system and the local sewage plant.<br>• Increase in construction vehicles. | - | | S | Yes | - |
| | | | Ground water | • Pollution due to construction vehicles. | - | | S | Yes | - |
| | | | Surface water | • Increase in storm water run-off.<br>• Pollution of water sources due to soil erosion.<br>• Destruction of watercourses (pans/dams/streams). | - | | S | Yes | - |
| | | SOCIAL/ECONOMIC ENVIRONMENT | Local unemployment rate | • Loss of employment. | | - | L | Yes | - |
| | | | Visual landscape | • Potential visual impact on visual receptors in close proximity to proposed facility. | - | | S | Yes | - |
| | | | Traffic volumes | • Increase in construction vehicles. | - | | S | Yes | - |
| | | | Health & Safety | • Air/dust pollution.<br>• Road safety.<br>• Increased crime levels. The presence of mine workers on the site may increase security risks | - | | S | Yes | - |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | associated with an increase in crime levels as a result of influx of people in the rural area. | | | | | |
| | | | Noise levels | • The generation of noise as a result of construction vehicles, the use of machinery and people working on the site. | - | | S | Yes | - |
| | | | Tourism industry | • Since there are tourism facilities in close proximity to the site, the decommissioning activities might have an impact on tourism in the area. | | + | M | Yes | - |
| | | | Heritage resources | • It is not foreseen that the decommissioning phase will impact on any heritage resources. | - | | S | Yes | - |

(N/A) No impact (+) Positive Impact (-) Negative Impact (S) Short Term (M) Medium Term (L) Long Term

**K) Where applicable, a summary of the findings and impact management measures identified in any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final report;**

No specialist studies to be conducted on the proposed area. Formal opinions from the relevant specialist studies has been submitted to DMRE (see appendix 7 and 8)**.** It must also be noted that there will be minimal impact on the environment and concurrent rehabilitation will be implemented immediately.

**L) An environmental impact statement which contains:**

**i. Summary of the key findings of the environmental impact assessment**

This section provides a summary of the assessment and conclusions drawn from the proposed mining activities. In doing so, it draws on the information gathered as part of the environmental impact assessment process and the knowledge gained by the environmental assessment practitioner during the course of the process and presents an informed opinion on the environmental impacts associated with the proposed project. The following conclusions can be drawn for the proposed mining activity:

- Potential impacts on aquatic biodiversity: According to the Critical Biodiversity Area, the proposed farm portions fall within Ecological Support Area 1 (ESA 1). But through implementing mitigation measures, no adverse impacts are expected.

- Potential social impacts: The presence of construction workers poses a potential risk to family structures and social networks. While the presence of construction workers does not in itself constitute a social impact, the manner in which construction workers conduct themselves can impact on local communities. The most significant negative impact is associated with the disruption of existing family structures and social networks.

- Potential negative impacts: (noise, dust, soil degradation, storm water, traffic, health and safety) associated with the operation of the facility are expected to be of low-medium impact, of medium terms and site specific. These can be mitigated or negated through the implementation of practical and appropriate mitigation measures.

- Positive impacts: The mining of iron ore and manganese generally will have socio-economic benefit to the area.

All possible negative impacts and risks that have been identified in this report and opinions from the specialists can be effectively mitigated and managed by implementing the migratory measures as set out in the Environmental Management Programme (EMPr) attached in Part B. It is therefore recommended that the environmental authorisation for the prospecting right be granted.

Upon the granting of environmental authorisation, the applicant must strictly adhere to the conditions outlined on the environmental authorisation and other relevant stakeholders due to the nature of the area.

**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.

Refer to Map plan is attached in **Appendix 2**

iii. **Summary of the positive and negative implications and risks of the proposed activity and identified alternatives**

- Increased noise levels
- Potential water and soil pollution impacts.
- Potential loss of fauna and flora.
- Increased vehicle activities
- Increased dust levels.
- Minimal impact on biodiversity
- Increase in water consumption and possible depletion of groundwater resources.
- Potential visual impacts.

All possible negative impacts and risks that have been identified in this report can be effectively mitigated and managed by implementing the mitigation measures as set out in the Environmental Management Programme (EMPr) attached in Part B. Therefore, this section provides a summary of the assessment and conclusions drawn

from the proposed mining of Manganese and iron ore on the area. No alternative was identified as the applicant has deep understanding of the minerals to be mined underneath.

**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*)

Recommendations from specialist reports

- It is very significant that opinions from palaeontologist and Aquatic biodiversity specialists must be implemented.

Management objectives include:

- Ensure that the prospecting activity does not cause pollution to the environment or harm to persons.
- Minimise production of waste.
- All prospecting activities must be conducted in a manner that minimises noise impact, litter, environmental degradation and health hazards i.e. injuries.
- The mine must be kept neat and tidy during waste handling to prevent unsightliness and accidents.

Expected outcomes include:

- Minimum impacts on the environment as a result of alluvial diamond prospecting.
- Compliance with legislative requirements.
- Mine is neat and tidy and well managed.

**N) Aspects for inclusion as conditions of Authorisation.**

- The operational activities and relevant rehabilitation of disturbed areas should be monitored against the improved EMPr and all other relevant environmental legislation.
- A copy of the EMPr should be made available onsite at all times.
- Implementation of the proposed mitigation measures set out in the EMPr must be implemented.

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

The EAP will ensure that sufficient information is provided to relevant parties in order to make an informed decision. Should the additional information needed to be provided to competent authority, such information will be provided by EAP and corresponded will be done to the applicant.

**P) Reasons as to whether the proposed activity should or should not be authorised;**

The reason not to approve the activities will result in a significant loss of valuable minerals and as well as many other economic benefits. There will also be creation of job opportunities for local people as a result of mining operations. Once when the operation commences, there will increase in the economy of the area, thereby improving the standard of living for the surrounding communities.

**Q) Where the proposed activity does not include operational aspects, the period for which the Environmental Authorisation is required, date on which the activity will be concluded, and the post construction monitoring requirements finalised;**

The mining activities will be conducted for a minimum of 3 years after the environmental authorisation has been approved.

**R) Undertaking**

The undertaking required to meet the requirements of this section is provided at the end of the EMPr and is applicable to both the Environmental Impact Assessment report and the Environmental Management Programme report. I, **Nephawe Mbavhalelo** (EAP) herewith confirm:

I. the correctness of the information provided in the reports ☒

II. the inclusion of comments and inputs from stakeholders and I&APs ; ☒

III. the inclusion of inputs and recommendations from the specialist reports where relevant; ☒and

IV. the acceptability of the project in relation to the finding of the assessment and level of mitigation proposed; ☒

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Signature of the Environmental Assessment Practitioner:

Murara Environmental Consultants (Pty) Ltd

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Name of company:

Date: 08 May 2023

**S) Where applicable, details of any financial provision for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts;**

Using the latest approved Quantum, the financial provision calculated from the amount of R150 045.00

**T) Any specific information that may be required by the competent authority; and**

No information to be required

**U) Any other matters required in terms of section 24(4)(a) and (b) of the Act**.

No information to be required

## PART B

## ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

### A. Details of the EAP

#### i) The EAP who prepared the report

#### ii) Expertise of the EAP

| Name of Practitioner | Qualifications | Contact details |
|---|---|---|
| Nephawe Mbavhalelo | Masters in Environmental Sciences in University of Venda<br><br>(Refer to **Appendix 1**) | Nephawe Mbavhalelo |

# Curriculum Vitae of Nephawe Mbavhalelo

**PERSONAL DETAILS**

| | |
|---|---|
| Surname: | Nephawe MWork Experience: 13 years |
| Date of birth: | 1986 November 14 |
| Identity Number: | 8611145928087 |
| Gender: | Male |
| Nationality: | South Africa |
| Language: | Tshivenda, Zulu, English, Sotho, Sepedi |
| Residential Address: | 58 Bourke Street, Pretoria |
| Email Address: | Muraraec@gmail.com |
| Contact Number: | 076 912 1618 |

**EDUCATION**

| Institution | Qualification | Completion date |
|---|---|---|
| University of South Africa**:** | National Diploma in Safety Management | 2020 |
| University of Venda: | Masters of Environmental Sciences | 2017 |
| University of Venda: | Bachelor of Environmental Management | 2008 |
| Guvhukuvhu Secondary School: | Grade 12 | 2004 |

**Masters research topic**: An assessment of the impacts of land use changes on the Duthuni Wetland stream using Remote Sensing,GIS and Social Survey: A case study in Limpopo Province, South Africa.

**SHORT COURSES**

| Institution | Training/Short Course | Completion |
|---|---|---|
| Lapalala Wilderness School | Environmental management | 2006 and 2008 |
| University of Pretoria | Wetland rehabilitation | 2010 |
| University of Pretoria | Land rehabilitation: reclamation and restoration | 2014 |
| Masana Social and Training development | National certificate of road work construction level 1 | 2009 |
| University of Venda | Geographical information System (GIS) | 2012 |
| Stellenbosch University | Introduction to Remote Sensing | 2013 |
| NOSA Training Institute | ISO 14001- Introduction and implementation of Environmental Management System | 2014 |
| University of Pretoria | Environmental Management Resource Inspector (EMRI) equivalent to EMI | 2016 |

**CURRENT WORK EXPERIENCE**

Organization: Murara Environmental Consultants
Occupation: Environmental Assessment Practitioner
Directorate: Environmental management

**RESPONSIBILITIES**

Compile Environmental Impact Assessment Report; Compile Environmental Management Programme (EMPr); Conduct environmental awareness trainings; environmental public participation process; Compile project progress/deliverables report (PPR) on monthly bases for the expanded public works programs (EPWP) projects; Monitor the person days in an monthly bases against the set targets for theentire project; Enforcing contractor to deliver what is written on the business plans; Facilitate accredited and non- accredited training are done by service provider; Facilitate site meeting and report feed back to the seniors; Keep all important documents for the project including workers contracts and compiling project closer reports.

Organization: Department of Minerals and Energy
Occupation: Environmental Officer (October 2014 to January 2018) Directorate: Environmental management

**PREVIOUS WORK EXPERIENCE**

**Environmental Officer- Department of minerals and energy**

- Plan and conduct environmental compliance inspections in response to public complaints of non-compliance
- Processing of technical environmental reports in terms of Mineral Resources Development Act 2002 and NEMA (Act 107 of 1998) as amended
- Processing waste management reports
- Conduct site visit for assessment (BAR) or Scoping/Environmental Impact Assessment (EIA) for projects screened
- Issuance of environmental authorisation in terms of the Environmental Impact Assessment process
- Co-ordination of closure certificates and inform holders of closure application procedure and requirements, calling up of bank guarantee, Processing of cancellation of bank guarantee, Handling of financial provisions and evaluate the adequacy of financial provision
- Management of stakeholder engagement, Liaison and networking and engage with all relevant stakeholders
- Consult with relevant State Departments and Plan and conduct environmental compliance inspections in response to public complaints of non-compliance to legislation.

**SKILLS SUMMARY**

- Knowledge of wetland conservation, management and rehabilitation.
- Knowledge of wetland-related legislations such as (NEMA, NWA, CARA, NEMBA).
- Knowledge of using GIS and remote sensing applications
- Practical experience of wetland rehabilitation and soil conservation
- Maintain schedules or time.
- Ability to work under pressure.
- Conflict resolution.
- Creative and critical thinking skill.
- Good coaching skill.
- Good mentoring skills
- Experience in project management and research

**REFERENCE**

**1. Name** : Mr. Maphiri NM
**Occupation** : Church representative
**Contact No** : 079 954 5997

**2. Name** : Mrs. Tshisevhe T.L
Department of Mineral Resources and energy
**Occupation** : Former supervisor
**Contact No** : 076 421 1152

**3. Name** : Mr Musetsho D
**Occupation** Naledzi Environmental Consultants
**Contact No** : 083 410 1437

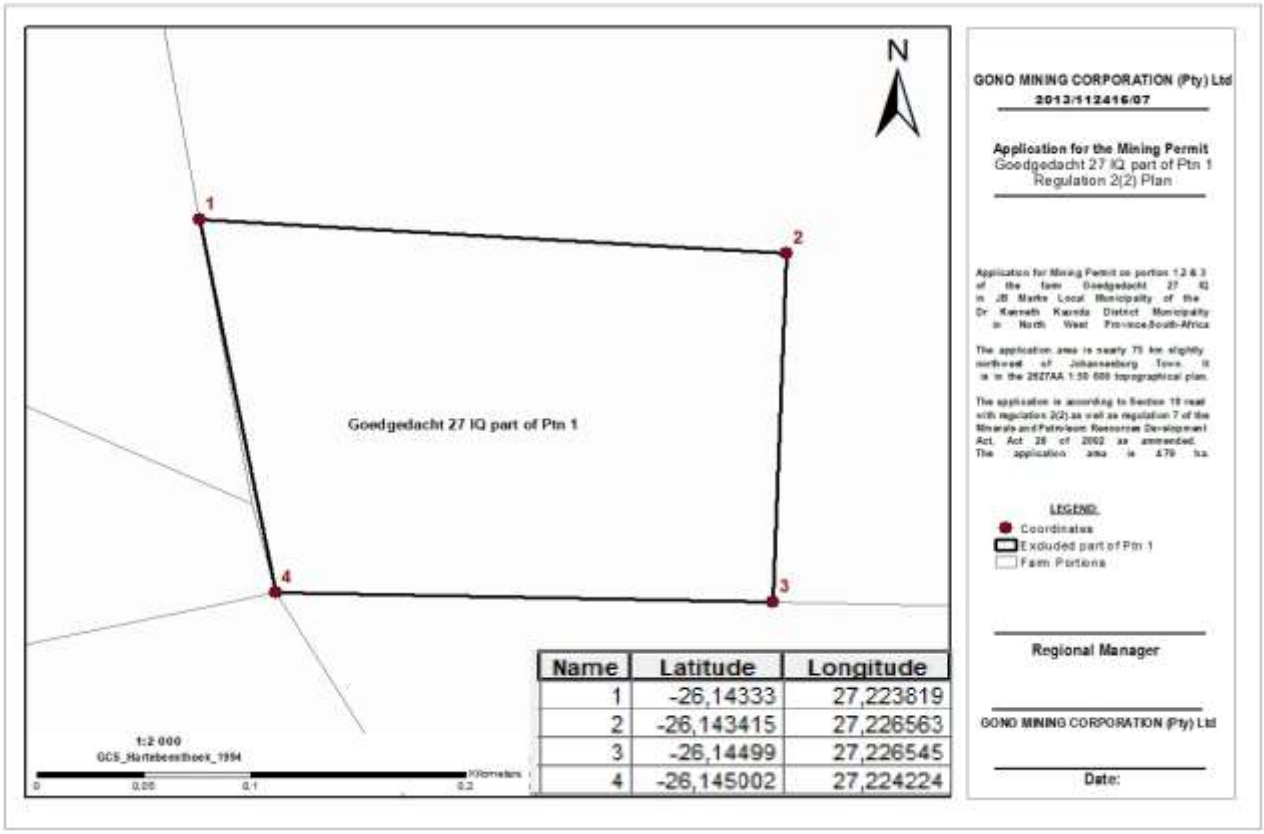
## B) DESCRIPTION OF THE ASPECTS OF THE ACTIVITY

The detailed description of the aspects of the activity is covered by the draft EMPr. There will be only five (5) trenches to be opened and site camp will be established with mobile ablution facility, site office and storage facilities.

## C) COMPOSITE MAP

The map is attached as an **Appendix 2**

Proposed area map




| Name | Latitude | Longitude |
|---|---|---|
| 1 | -26,14333 | 27,223819 |
| 2 | -26,143415 | 27,226563 |
| 3 | -26,14499 | 27,226545 |
| 4 | -26,145002 | 27,224224 |

## D) DESCRIPTION OF IMPACT MANAGEMENT OBJECTIVES INCLUDING MANAGEMENT STATEMENTS

A description of the impact management objectives, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including:

i) Planning and design;

(ii) Pre-construction activities;

(iii) Construction activities;

(iv) Rehabilitation of the environment after construction and where applicable post closure; and

(v) Where relevant, operation activities;

- **Description of the impact management objectives**

Closure objectives for the mining of Manganese and iron ore will aim to ensure that the residual post-closure impacts be minimized and be acceptable to relevant parties. To achieve these closure objectives, the following will be implemented:

- To create a landscape that is self-sustaining and over time will evolve to the desired ecosystem structure, function and composition.
- All mining related infrastructure, foundations and concrete areas will be decommissioned, removed from the site and appropriately disposed of. Reclaimable structures such as metal, electrical installations or equipment will be sold for re-use or as scrap.
- All disturbed areas within the site not already vegetated will be re-vegetated with appropriate indigenous, ecologically adapted species appropriate to the area and the final land use as soon as possible after operation ceases.
- To ensure that surface infrastructure and mining residue and/or disturbances that are present at processing plant decommissioning will be removed and/or stabilised in a manner that these will not compromise post-closure land use and be sustainable long-term landforms.
- Conducting soil clean-up/remediation to ensure that the planned land use could be implemented and maintained;
- Shaping of embankments and trenches to safe slopes and reintegrating of these into surrounding topography.
- To ensure that the overall rehabilitated mining site is free draining
- Transferring mining related surface infrastructure to third parties for beneficial use after closure.

- To ensure that the rehabilitated mining site will display, at a minimum, an acceptable aesthetic appearance that would not compromise the planned land use e.g. Rehabilitated mining residues that are suitably landscaped, blending with the surrounding environment as far as possible and shaped and rehabilitated terrace and hard stand areas, roughly emulating the local natural surface topography.

- **Impacts to be mitigated in their respective phases**

**Measures to rehabilitate the environment affected by the undertaking of any listed activity**

| ACTIVITIES | PHASE | SIZE AND SCALE of disturbance | MITIGATION MEASURES | COMPLIANCE WITH STANDARDS | TIME PERIOD FOR IMPLEMENTATION |
|---|---|---|---|---|---|
| **(E.g. mining of Manganese and iron ore-** drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route **etc…etc…etc**<br><br>**E.g. For mining**,- excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and | (Operation in which activity will take place.<br><br>State;<br><br>Planning and design,<br><br>Pre-Construction'<br><br>Construction,<br><br>Operational, | (volumes, tonnages and hectares or m²) | (describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants) | (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) | 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:- |

| | | | | | |
|---|---|---|---|---|---|
| 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.) | Rehabilitation,<br><br>Closure, Post closure). | | | | Upon cessation of the individual activity<br><br>Or.<br><br>Upon the cessation of mining, bulk sampling or Manganese and iron ore mining as the case may be. |
| Clearance of vegetation for excavating trenches | 5 Trenching will be conducted during the phase- (construction and operation phase) | 0.02 Ha is the total areas that will be disturbed and where mining activities takes place, will be cleared. | 1. Site clearing must take place in a phased manner, as and when required.<br>2. Areas which are not to be mined on within two months must not be cleared to reduce erosion risks.<br>3. The area to be cleared must be clearly demarcated and this footprint strictly maintained.<br>4. Spoil that is removed from the site must be removed to an | Compliance with Duty of Care as detailed within NEMA | Duration of operations on the mining activities. |

| | | | | | |
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| | | | approved spoil site or a licensed landfill site. | | |
| Upgrading of the existing roads | There will be an upgrading and maintenance of the existing road. | | 1. Planning of access routes to the site for upgrading purposes shall be done in conjunction with the Contractor and the Landowner. All agreements reached should be documented and no verbal agreements should be made. The Contractor shall clearly mark all access roads. Roads not to be used shall be marked with a “NO ENTRY” sign, for mining vehicles.<br>2. Upgraded routes and required access roads must be clearly defined.<br>3. Damping down of the un-surfaced roads must be implemented to reduce dust and nuisance. | Compliance with Duty of Care as detailed within NEMA | Duration of operations on the mining activities. |

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| | | | 4. Soils compacted during the upgrading activities shall be deep ripped to loosen compacted layers and re-graded to even running levels.<br>5. The contractor must ensure that damage caused by related traffic during the construction is repaired continuously. The costs associated with the repair must be borne by the contractor;<br>6. Dust suppression measures must be implemented for heavy vehicles, for example wetting of gravel roads on a regular basis and ensuring that vehicles used to transport the gravel are fitted with tarpaulins or covers;<br>7. All vehicles must be road-worthy and drivers must be qualified and made aware of | | |

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| | | | the potential road safety issues and need for strict speed limits. | | |
| Mining of Manganese and iron ore- Soils and geology | Mining, (construction and operation phase) | 0.02 ha is the only areas where proposed activities will take place, must be cleared. | 1. The Contractor should, prior to the commencement of earthworks determine the average depth of topsoil (If topsoil exists) and agree on this with the ECO. The full depth of topsoil should be stripped from areas affected by construction and related activities prior to the commencement of major earthworks. This should include the building footprints, working areas and storage areas. Topsoil must be reused where possible to rehabilitate disturbed areas.<br>2. Care must be taken not to mix topsoil and subsoil or any other material, during stripping. | Compliance with Duty of Care as detailed within NEMA | Duration of operations on the proposed area. |

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| | | | 3. The topsoil must be conserved on site in and around the pit/trench area.<br>4. Subsoil and overburden in the mining area should be stockpiled separately to be returned for backfilling in the correct soil horizon order.<br>5. If stockpiles are exposed to windy conditions or heavy rain, they should be covered either by vegetation or geofabric, depending on the duration of the project. Stockpiles may further be protected by the construction of berms, trenches or low brick walls around their bases.<br>6. Stockpiles should be kept clear of weeds and alien vegetation growth by regular weeding (to avoid wide spread of alien plants within the area). | | |

**E) Impact Management Outcomes**

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

| **ACTIVITY**<br><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,** | **POTENTIAL IMPACT**<br><br>**(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc….etc…)** | **ASPECTS AFFECTED** | **PHASE**<br><br>In which impact is anticipated<br><br>**(e.g. Construction, commissioning, operational**<br><br>**Decommissioning, closure, post-closure)** | **MITIGATION**<br><br>**TYPE**<br><br>**(modify, remedy, control, or stop)**<br><br>**through**<br><br>**(e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc)**<br><br>**E.g.**<br><br>• **Modify through alternative method.**<br>• **Control through noise control** | **STANDARD TO BE ACHIEVED**<br><br>**(Impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives) etc.** |
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| **pipelines, power lines, conveyors, etc…etc…etc.)**. | | | | • **Control through management and monitoring**<br>• **Remedy through rehabilitation.** | |
| Clearance of vegetation | Loss or fragmentation of habitats | Fauna & flora | trenching phase-(construction and operation phase) | **Existing vegetation**<br><br>1. Vegetation removal must be limited only to the mining area.<br>2. Vegetation to be removed as it becomes necessary rather than removal of all vegetation throughout the site in one step.<br>3. No vegetation to be used for firewood.<br>4. Exotic and invasive plant species should not be allowed to establish, if the development is approved.<br>5. There should be a preconstruction walk-through of the development footprint/project site in order to locate individuals of plant species of conservation concern. A search and rescue exercise must be done to locate and relocate any protected species to a suitable and similar | Minimisation of impacts to acceptable limits |

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| | | | | habitat where these plants can grow without any disturbance;<br><br>**Rehabilitation**<br><br>6. All damaged areas shall be rehabilitated upon completion of the contract.<br>7. Re-vegetation of the disturbed site is aimed at approximating as near as possible the natural vegetative conditions prevailing prior to construction.<br>8. All natural areas impacted during the mining must be rehabilitated with locally indigenous plants typical of the representative botanical unit.<br>9. Rehabilitation must take place in a phased approach as soon as possible.<br>10. Rehabilitation process must make use of species indigenous to the | |

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| | | | | area. Seeds from surrounding seed banks can be used for re-seeding.<br>11. Rehabilitation must be executed in such a way that ensures surface run-off will not cause erosion of disturbed areas.<br>12. Planting of indigenous tree species in areas not to be cultivated or built on must be encouraged.<br><br>**Demarcation of mining area**<br><br>13. All plants not interfering with mining operations must be left undisturbed, clearly marked and indicated on the site plan.<br>14. The mining area must be well demarcated and no mining activities must be allowed outside of this demarcated footprint.<br>15. Vegetation removal must be phased in order to reduce impact of construction. | |

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| | | | | 16. Site office and laydown areas must be clearly demarcated and no encroachment must occur beyond demarcated areas.<br>17. Strict and regular auditing of the construction process to ensure containment of the construction and laydown areas.<br>18. Soils must be kept free of petrochemical solutions that may be kept on site during construction. Spillage can result in a loss of soil functionality thus limiting the re-establishment of flora.<br><br>**Utilization of resources**<br><br>19. Gathering of firewood, fruit, medicinal plants, or any other natural material onsite or in areas adjacent to the site is prohibited unless with prior approval of the ECO. | |

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| | | | | **Exotic vegetation**<br><br>20. Alien vegetation on the site will need to be removed.<br>21. The Contractor should be responsible for implementing a programme of weed control (particularly in areas where soil has been disturbed); and grassing of any remaining stockpiles to prevent weed invasion.<br>22. The spread of exotic species occurring throughout the site should be controlled.<br>23. Weed control measures must be applied to eradicate any noxious weeds (category 1a &1b species) on disturbed areas.<br><br>**Herbicides**<br><br>24. Herbicide use shall only be allowed according to contract specifications. The application shall be according | |

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| | | | | to set specifications and under supervision of a qualified technician. The possibility of leaching into the surrounding environment shall be properly investigated and only environmentally friendly herbicides shall be used.<br>25. The use of pesticides and herbicides on the site must be discouraged as this impact on important pollinator species of indigenous vegetation.<br><br>**Fauna**<br><br>26. Rehabilitation to be undertaken as soon as possible after the mining activities have been completed.<br>27. No trapping or snaring to fauna during construction on site should be allowed. | |

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| | | | | 28. No faunal species must be disturbed, trapped, hunted or killed by maintenance staff during any routine maintenance at the development.<br>29. Any fauna threatened by the construction and operation activities should be removed to safety by the ECO or appropriately qualified environmental officer.<br>30. All construction vehicles should adhere to a low speed limit (<30km/h) to avoid collisions with susceptible species such as rabbits, snakes and tortoises.<br>31. If trenches need to be dug for electrical cabling or other purposes, these should not be left open for extended periods of time to avoid falling of fauna on the trenches and trapped inside. Trenches which are exposed should contain soil ramps allowing fauna to escape the trench. | |

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| Mining of Manganese and iron ore and the excavations | Loss of topsoil | Soil | Trenching phase- (construction and operation phase) | 1. The Contractor should, prior to the commencement of earthworks determine the average depth of topsoil, and agree on this with the ECO. The full depth of topsoil should be stripped from areas affected by construction and related activities prior to the commencement of major earthworks. This should include the building footprints, working areas and storage areas. Topsoil must be reused where possible to rehabilitate disturbed areas.<br>2. Care must be taken not to mix topsoil and subsoil or any other material, during stripping.<br>3. The topsoil must be conserved on site in and around the pit/trench area.<br>4. Subsoil and overburden in the mining area should be stockpiled separately to be returned for | Minimisation of impacts to acceptable limits |

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| | | | | backfilling in the correct soil horizon order.<br>5. If stockpiles are exposed to windy conditions or heavy rain, they should be covered either by vegetation or geofabric, depending on the duration of the project. Stockpiles may further be protected by the construction of berms or low brick walls around their bases.<br>6. Stockpiles should be kept clear of weeds and alien vegetation growth by regular weeding.<br>7. Where contamination of soil is expected, analysis must be done prior to disposal of soil to determine the appropriate disposal route. Proof from an approved waste disposal site where contaminated soils are dumped if and when a spillage/leakage occurs should be attained and given to the project manager. | |

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| | | | | Establish an effective record keeping system for each area where soil is disturbed for mining purposes. These records should be included in environmental performance reports, and should include all the records below.<br><br>• Record the GPS coordinates of each area.<br>• Record the date of topsoil stripping.<br>• Record the GPS coordinates of where the topsoil is stockpiled.<br>• Record the date of cessation mining activities at the particular site.<br>• Photograph the area on cessation of mining activities.<br>• Record date and depth of re-spreading of topsoil.<br>• Photograph the area on completion of rehabilitation and on an annual basis thereafter to show vegetation | |

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| | | | | establishment and evaluate progress of restoration over time. | |
| | Erosion | Soil, Air and Water | -(construction and operation phase) | 1. An effective system of run-off control should be implemented, where it is required, that collects and safely disseminates run-off water from all hardened surfaces and prevents potential down slope erosion.<br>2. Periodical site inspection should be included in environmental performance reporting that inspects the effectiveness of the run-off control system and specifically records the occurrence of any erosion on site or downstream.<br>3. Implement an effective system of run-off control, where it is required, that collects and safely disseminates run-off water from all hardened surfaces and prevents potential down slope erosion. | Minimisation of impacts to acceptable limits |

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| | | | | 4. Monitor the area regularly after larger rainfall events to determine where erosion may be initiated and then mitigate by modifying the soil micro-topography and re-vegetation or soil erosion control efforts accordingly<br>5. Wind screening and storm water control should be undertaken to prevent soil loss from the site.<br>6. The use of silt fences and sand bags must be implemented in areas that are susceptible to erosion.<br>7. Other erosion control measures that can be implemented are as follows:<br>o Brush packing with cleared vegetation<br>o Mulch or chip packing<br>o Planting of vegetation<br>o Hydro seeding/hand sowing<br>8. Sensitive areas need to be identified prior to construction in order to implement necessary precautions can be implemented. | |

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| | | | | 9. All erosion control mechanisms need to be regularly maintained.<br>10. Seeding of topsoil and subsoil stockpiles must be done to prevent wind and water erosion of soil surfaces.<br>11. Retention of vegetation where possible to avoid soil erosion.<br>12. Vegetation clearance should be phased to ensure that the minimum area of soil is exposed to potential erosion at any one time.<br>13. Re-vegetation of disturbed surfaces should occur immediately after mining activities are completed. This should be done through seeding with indigenous grasses.<br>14. No impediment to the natural water flow other than approved erosion control works is permitted.<br>15. To prevent stormwater damage, the increase in stormwater run-off resulting from construction activities | |

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| | | | | must be estimated and the drainage system assessed accordingly.<br>16. Stockpiles not used in three (3) months after stripping must be seeded or backfilled to prevent dust and erosion. | |
| | Air Pollution | Air | (construction and operation phase) | **Dust control**<br><br>1. Wheel washing and damping down of un-surfaced and un-vegetated areas.<br>2. Retention of vegetation where possible will reduce dust travel.<br>3. Clearing activities must only be done during agreed working times and permitting weather conditions to avoid drifting of sand and dust into neighboring areas.<br>4. Damping down of all exposed soil surfaces with a water bowser or sprinklers when necessary to reduce dust.<br>5. The Contractor shall be responsible for dust control on site to ensure no | Minimisation of impacts to acceptable limits |

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| | | | | nuisance is caused to the neighboring communities.<br>6. A speed limit of 30km/h must not be exceeded on site.<br>7. Any complaints or claims emanating from the lack of dust control shall be attended to immediately by the Contractor.<br>8. Any dirt roads that are utilized by the workers must be regularly maintained to ensure that dust levels are controlled.<br><br>**Odour control**<br><br>9. Regular servicing of vehicles to limit gaseous emissions.<br>10. Regular servicing of onsite toilets to avoid potential odours.<br><br>**Rehabilitation**<br><br>11. The Contractor should commence rehabilitation of exposed soil | |

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| | | | | surfaces as soon as practical after completion of earthworks.<br><br>**Fire prevention**<br><br>12. No open fires shall be allowed on site under any circumstance. All cooking shall be done in demarcated areas that are safe and cannot cause runaway fires.<br>13. The Contractor shall always have operational fire-fighting equipment available on site. The level of firefighting equipment must be assessed and evaluated through a typical risk assessment process. | |
| | Noise | | (construction and operation phase) | 1. The mining activities must aim to adhere to the relevant noise regulations and limit noise to within standard working hours to reduce disturbance of dwellings in close proximity to the development.<br>2. Mine, crushers, workshops, and other noisy fixed facilities should be | Minimisation of impacts to acceptable limits |

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| | | | | located well away from noise sensitive areas. Once the proposed final layouts are made available by the Contractor(s), the sites must be evaluated in detail and specific measures designed into the system.<br>3. Truck traffic should be routed away from noise sensitive areas, where possible.<br>4. Noise levels must be kept within acceptable limits.<br>5. Noisy operations should be combined so that they occur where possible at the same time.<br>6. Mine workers to wear necessary ear protection gear.<br>7. Noisy activities to take place during allocated hours.<br>8. Noise from laborers must be controlled.<br>9. Noise suppression measures must be applied to all equipment. Equipment must be kept in good | |

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| | | | | working order and where appropriate fitted with silencers which are kept in good working order. Should the vehicles or equipment not be in good working order, the Contractor may be instructed to remove the offending vehicle or machinery from the site.<br>10. The Contractor must take measures to discourage laborers from loitering in the area and causing noise disturbance. Where possible laborers shall be transported to and from the site by the Contractor or his Sub-Contractors by the Contractors own transport.<br>11. Implementation of enclosure and cladding of processing plants.<br>12. Applying regular and thorough maintenance schedules to equipment and processes. An increase in noise emission levels very often is a sign of the imminent mechanical failure of a machine. | |

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| | Impact on potential cultural, heritage artefacts and fossils. | Heritage and Paleontology | (construction and operation phase) | 1. Any discovery of artefacts must be reported to the nearest National Monuments office to comply with the National Heritage Resources Act (Act No 25 of 1999) and to DEFF.<br>2. Local museums as well as the South African Heritage Resource Agency (SAHRA) should be informed if any artefacts/ fossils are uncovered in the affected area.<br>3. The Contractor must ensure that his workforce is aware of the necessity of reporting any possible historical, archaeological or palaeontological finds to the ECO so that appropriate action can be taken.<br>4. Known sites should be clearly marked in order that they can be avoided. The work force should also be informed that fenced-off areas are no-go areas.<br>5. The ECO must also survey for heritage and palaeontological | Minimisation of impacts to acceptable limits |

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| | | | | artefacts during ground breaking and digging or drilling. He/she should familiarise themselves with formations and its fossils or a palaeontologist should be appointed during the digging and excavation phase of the development.<br>6. All digging, excavating, drilling or blasting activities must be stopped if heritage and/or Palaeontological artefacts are uncovered and a specialist should be called in to determine proper management, mitigation, excavation and/or collecting measures.<br>7. Any discovered artefacts or fossils shall not be removed under any circumstances. Any destruction of a site can only be allowed once a permit is obtained and the site has been mapped and noted. Permits shall be obtained from SAHRA should the proposed site affect any | |

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| | | | | world heritage/paleontology sites or if any heritage/palaeontology sites are to be destroyed or altered.<br>8. Under no circumstances shall any artefacts be removed, destroyed or interfered with by anyone on the site; and contractors and workers shall be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or paleontological artefacts, as set out in the NHRA (Act No. 25 of 1999), Section 51. (1). | |
| Waste management | | Pollution | (construction and operation phase) | **Litter management**<br><br>1. Refuse bins must be placed at strategic positions to ensure that litter does not accumulate within the construction site.<br>2. The Contractor shall supply waste collection bins where such is not available and all solid waste | Minimisation of impacts to acceptable limits |

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| | | | | collected shall be disposed of at registered/licensed landfill.<br>3. Good housekeeping practices should be implemented to regularly maintain the litter and rubble situation on the construction site.<br>4. If possible and feasible, all waste generated on site must be separated into glass, plastic, paper, metal and wood and recycled. An independent contractor can be appointed to conduct this recycling.<br>5. Littering by the employees of the Contractor shall not be allowed under any circumstances. The ECO shall monitor the neatness of the work sites as well as the Contractor campsite.<br>6. Skip waste containers should be maintained on site. These should be kept covered and arrangements made for them to be collected regularly. | |

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| | | | | 7. All waste must be removed from the site and transported to a landfill site promptly to ensure that it does not attract vermin or produce odours.<br>8. Where a registered waste site is not available close to the construction site, the Contractor shall provide a method statement with regard to waste management.<br>9. A certificate of disposal shall be obtained by the Contractor and kept on file, if relevant.<br>10. Under no circumstances may solid waste be burnt on site.<br>11. All waste must be removed promptly to ensure that it does not attract vermin or produce odours.<br><br>**Hazardous waste**<br><br>12. All waste hazardous materials must be carefully stored as advised by the ECO, and then disposed of offsite at a licensed landfill site, | |

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| | | | | where practical. Incineration may be used where relevant.<br>13. Contaminants to be stored safely to avoid spillage.<br>14. Machinery must be properly maintained to keep oil leaks in check.<br>15. All necessary precaution measures shall be taken to prevent soil or surface water pollution from hazardous materials used during construction and any spills shall immediately be cleaned up and all affected areas rehabilitated.<br><br>**Sanitation**<br><br>16. The Contractor shall install mobile chemical toilets on the site.<br>17. Staff shall be informed to the fact that they should use these facilities at all times. No indiscriminate sanitary activities on site shall be allowed. | |

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| | | | | 18. Toilets shall be serviced regularly and the ECO shall inspect toilets regularly.<br>19. Toilets should be no closer than 50m or above the 1:100 year flood line from any natural or manmade water bodies or drainage lines or alternatively located in a place approved of by the Engineer.<br>20. Under no circumstances may open areas, neighbor's fences or the surrounding bush be used as a toilet facility.<br>21. The construction of "Long Drop" toilets is forbidden, but rather toilets connected to the sewage treatment plant.<br>22. Potable water must be provided for all construction staff.<br><br>**Remedial actions**<br><br>23. Depending on the nature and extent of the spill, contaminated soil must | |

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| | | | | be either excavated or treated on-site.<br>24. Excavation of contaminated soil must involve careful removal of soil using appropriate tools/machinery to storage containers until treated or disposed of at a licensed hazardous landfill site.<br>25. The ECO must determine the precise method of treatment for polluted soil. This could involve the application of soil absorbent materials as well as oil-digestive powders to the contaminated soil.<br>26. If a spill occurs on an impermeable surface such as cement or concrete, the surface spill must be contained using oil absorbent material.<br>27. If necessary, oil absorbent sheets or pads must be attached to leaky machinery or infrastructure.<br>28. Materials used for the remediation of petrochemical spills must be | |

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| | | | | used according to product specifications and guidance for use.<br>29. Contaminated remediation materials must be carefully removed from the area of the spill so as to prevent further release of petrochemicals to the environment, and stored in adequate containers until appropriate disposal. | |
| Water Use and Quality | Water pollution | Water | (construction and operation phase) | **Water Use**<br><br>1. Develop a sustainable water supply management plan to minimize the impact to natural systems by managing water use, avoiding depletion of aquifers and minimizing impacts to water users.<br>2. Water must be reused, recycled or treated where possible.<br><br>**Water Quality** | |

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| | | | | 3. The quality and quantity of effluent streams discharged to the environment including stormwater should be managed and treated to meet applicable effluent discharge guidelines.<br>4. Discharge to surface water should not result in contaminant concentrations in excess of local ambient water quality criteria outside a scientifically established mixing zone.<br>5. Efficient oil and grease traps or sumps should be installed and maintained at refueling facilities, workshops, fuel storage depots, and containment areas and spill kits should be available with emergency response plans.<br><br>**Stormwater**<br><br>6. The site must be managed in order to prevent pollution of drains, | |

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| | | | | downstream watercourses or groundwater, due to suspended solids and silt or chemical pollutants.<br>7. Silt fences should be used to prevent any soil entering the stormwater drains.<br>8. Temporary cut off drains and berms may be required to capture stormwater and promote infiltration.<br>9. Promote a water saving mind set with construction workers in order to Contractor ensure less water wastage.<br>10. Hazardous substances must be stored at least 100m from any water bodies on site to avoid pollution.<br>11. The installation of the stormwater system must take place as soon as possible to attenuate stormwater from the construction phase as well as the operation phase.<br>12. Earth, stone and rubble is to be properly disposed of, or utilized on | |

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| | | | | site so as not to obstruct natural water path ways over the site. i.e. these materials must not be placed in stormwater channels, drainage lines or rivers.<br>13. There should be a periodic checking of the site's drainage system to ensure that the water flow is unobstructed.<br>14. If a batching plant is necessary, run-off should be managed effectively to avoid contamination of other areas of the site. Untreated runoff from the batch plant must not be allowed to get into the storm water system or nearby streams, rivers or erosion channels or dongas.<br><br>**Sanitation**<br><br>15. Adequate sanitary facilities and ablutions must be provided for construction workers (1 toilet per every 15 workers). | |

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| | | | | 16. The facilities must be regularly serviced to reduce the risk of surface or groundwater pollution.<br><br>**Concrete mixing**<br><br>17. Concrete contaminated water must not enter soil or any natural drainage system as this disturbs the natural acidity of the soil and affects plant growth.<br><br>**Public areas**<br><br>18. Food preparation areas should be provided with adequate washing facilities and food refuse should be stored in sealed refuse bins which should be removed from site on a regular basis the steps to ensure that littering by construction workers does not occur and persons should be employed on site to collect litter | |

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| | | | | from the site and immediate surroundings, including litter accumulating at fence lines.<br>19. No washing of cars at the site | |

**F) Impact Management Actions**

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

| **ACTIVITY** | **POTENTIAL IMPACT** | **MITIGATION TYPE** | **TIME PERIOD FOR IMPLEMENTATION** | **COMPLIANCE WITH STANDARDS** |
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| Whether listed or not listed. **(E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and** | **(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc….etc…)** | **(modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc.)** | Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to | 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 environmental management standards or practices that |

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| **boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)**. | | • **Modify through alternative method.**<br>• **Control through noise control**<br>• **Control through management and monitoring**<br>• **Remedy through rehabilitation.** | Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:<br><br>Upon cessation of the individual activity or upon the cessation of mining, bulk sampling or Manganese and iron ore mining as the case may be. | have been identified by Competent Authorities |
| Clearance of vegetation | Loss or fragmentation of habitats | **Existing vegetation**<br><br>1. Vegetation removal must be limited to the mining site.<br>2. Vegetation to be removed as it becomes necessary rather than removal of all vegetation throughout the site in one step.<br>3. No vegetation to be used for firewood. | Duration of operation | The implementation of the recommended mitigation measures will result in the minimisation of impacts to acceptable standards, thereby ensuring compliance with NEMA and Duty of Care as prescribed by NEMA. |

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| | | 4. Exotic and invasive plant species should not be allowed to establish, if the development is approved.<br>5. There should be a preconstruction walk-through of the development footprint/project site in order to locate individuals of plant species of conservation concern. A search and rescue exercise must be done to locate and relocate any protected species to a suitable and similar habitat where these plants can grow without any disturbance.<br><br>**Rehabilitation**<br><br>6. All damaged areas shall be rehabilitated upon completion of the contract.<br>7. Re-vegetation of the disturbed site is aimed at approximating as near as possible the natural vegetative conditions prevailing prior to construction. | | |

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| | | 8. All natural areas impacted during mining activities must be rehabilitated with locally indigenous grasses typical of the representative botanical unit.<br>9. Rehabilitation must take place in a phased approach as soon as possible.<br>10. Rehabilitation process must make use of species indigenous to the area. Seeds from surrounding seed banks can be used for re-seeding.<br>11. Rehabilitation must be executed in such a manner that surface run-off will not cause erosion of disturbed areas.<br>12. Planting of indigenous tree species in areas not to be cultivated or built on must be encouraged.<br><br>**Demarcation of mining area** | | |

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| | | 13. All plants not interfering with mining operations shall be left undisturbed clearly marked and indicated on the site plan.<br>14. The mining area must be well demarcated and no construction activities must be allowed outside of this demarcated footprint.<br>15. Vegetation removal must be phased in order to reduce impact of construction/mining.<br>16. Site office and laydown areas must be clearly demarcated and no encroachment must occur beyond demarcated areas.<br>17. Strict and regular auditing of the mining process to ensure containment of the mining and laydown areas.<br>18. Soils must be kept free of petrochemical solutions that may be kept on site during construction. Spillage can result in a loss of soil | | |

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| | | functionality thus limiting the re-establishment of flora.<br><br>**Utilization of resources**<br><br>19. Gathering of firewood, fruit, medicinal plants, or any other natural material onsite or in areas adjacent to the site is prohibited unless with prior approval of the ECO.<br><br>**Exotic vegetation**<br><br>20. Alien vegetation on the site will need to be controlled.<br>21. The Contractor should be responsible for implementing a programme of weed control (particularly in areas where soil has been disturbed); and grassing of any remaining stockpiles to prevent weed invasion. | | |

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| | | 22. The spread of exotic species occurring throughout the site should be controlled.<br>23. Weed control measures must be applied to eradicate any noxious weeds (category 1a &1b species) on disturbed areas.<br><br>**Herbicies**<br><br>24. Herbicide use shall only be allowed according to contract specifications. The application shall be according to set specifications and under supervision of a qualified technician. The possibility of leaching into the surrounding environment shall be properly investigated and only environmentally friendly herbicides shall be used.<br>25. The use of pesticides and herbicides on the site must be | | |

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| | | discouraged as these impacts on important pollinator species of indigenous vegetation.<br><br>**Fauna**<br><br>26. Rehabilitation to be undertaken as soon as possible after mining has been completed.<br>27. No trapping or snaring to fauna on the construction/mining site should be allowed.<br>28. No faunal species must be disturbed, trapped, hunted or killed by maintenance staff during any routine maintenance at the development.<br>29. Any fauna threatened by the construction and operation activities should be removed to safety by the ECO or appropriately qualified environmental officer.<br>30. All construction vehicles should adhere to a low speed limit | | |

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| | | (<30km/h) to avoid collisions with susceptible species such as snakes and tortoises.<br>31. If trenches need to be dug for electrical cabling or other purposes, these should not be left open for extended periods of time as fauna may fall in and become trapped in them. Trenches which are exposed should contain soil ramps allowing fauna to escape the trench. | | |
| mining of Manganese and iron ore and the excavations | Loss of top soil | 1. The Contractor should, prior to the commencement of earthworks determine the average depth of topsoil, and agree on this with the ECO. The full depth of topsoil should be stripped from areas affected by construction/mining and related activities prior to the commencement of major earthworks. This should include the building footprints, working | Duration of operation | The implementation of the recommended mitigation measures will result in the minimisation of impacts to acceptable standards, thereby ensuring compliance with NEMA and Duty of Care as prescribed by NEMA. |

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| | | areas and storage areas. Topsoil must be reused where possible to rehabilitate disturbed areas.<br>2. Care must be taken not to mix topsoil and subsoil or any other material, during stripping.<br>3. The topsoil must be conserved on site in and around the pit/trench area.<br>4. Subsoil and overburden in the mining area should be stockpiled separately to be returned for backfilling in the correct soil horizon order.<br>5. If stockpiles are exposed to windy conditions or heavy rain, they should be covered either by vegetation or geofabric, depending on the duration of the project. Stockpiles may further be protected by the construction of berms or low brick walls around their bases. | | |

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| | | 6. Stockpiles should be kept clear of weeds and alien vegetation growth by regular weeding.<br>7. Where contamination of soil is expected, analysis must be done prior to disposal of soil to determine the appropriate disposal route. Proof from an approved waste disposal site where contaminated soils are dumped if and when a spillage/leakage occurs should be attained and given to the project manager.<br><br>Establish an effective record keeping system for each area where soil is disturbed for mining purposes. These records should be included in environmental performance reports, and should include all the records below.<br><br>• Record the GPS coordinates of each area. | | |

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| | | • Record the date of topsoil stripping.<br>• Record the GPS coordinates of where the topsoil is stockpiled.<br>• Record the date of cessation mining activities at the particular site.<br>• Photograph the area on cessation of mining activities.<br>• Record date and depth of re-spreading of topsoil.<br>• Photograph the area on completion of rehabilitation and on an annual basis thereafter to show vegetation establishment and evaluate progress of restoration over time. | | |
| | Erosion | 1. An effective system of run-off control should be implemented, where it is required, that collects and safely disseminates run-off water from all hardened surfaces | Duration of operation | The implementation of the recommended mitigation measures will result in the minimisation of impacts to acceptable standards, thereby ensuring compliance |

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| | | and prevents potential down slope erosion.<br>2. Periodical site inspection should be included in environmental performance reporting that inspects the effectiveness of the run-off control system and specifically records the occurrence of any erosion on site or downstream.<br>3. Implement an effective system of run-off control, where it is required, that collects and safely disseminates run-off water from all hardened surfaces and prevents potential down slope erosion.<br>4. Monitor the area regularly after larger rainfall events to determine where erosion may be initiated and then mitigate by modifying the soil micro-topography and re-vegetation or soil erosion control efforts accordingly | | with NEMA and Duty of Care as prescribed by NEMA. |

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| | | 5. Wind screening and stormwater control should be undertaken to prevent soil loss from the site.<br>6. The use of silt fences and sand bags must be implemented in areas that are susceptible to erosion.<br>7. Other erosion control measures that can be implemented are as follows:<br>• Brush packing with cleared vegetation<br>• Mulch or chip packing<br>• Planting of vegetation<br>• Hydroseeding/hand sowing<br>8. Sensitive areas need to be identified prior to construction so that the necessary precautions can be implemented.<br>9. All erosion control mechanisms need to be regularly maintained. | | |

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| | | 10. Seeding of topsoil and subsoil stockpiles to prevent wind and water erosion of soil surfaces.<br>11. Retention of vegetation where possible to avoid soil erosion.<br>12. Vegetation clearance should be phased to ensure that the minimum area of soil is exposed to potential erosion at any one time.<br>13. Re-vegetation of disturbed surfaces should occur immediately after construction/mining activities are completed. This should be done through seeding with indigenous grasses.<br>14. No impediment to the natural water flow other than approved erosion control works is permitted.<br>15. To prevent stormwater damage, the increase in stormwater run-off resulting from construction activities must be estimated and the drainage system assessed accordingly. A drainage plan must | | |

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| | | be submitted to the Engineer for approval and must include the location and design criteria of any temporary stream crossings.<br>16. Stockpiles not used in three (3) months after stripping must be seeded /backfilled to prevent dust and erosion. | | |
| . | Air Pollution | **Dust control**<br><br>1. Wheel washing and damping down of un-surfaced and un-vegetated areas.<br>2. Retention of vegetation where possible will reduce dust travel.<br>3. Clearing activities must only be done during agreed working times and permitting weather conditions to avoid drifting of sand and dust into neighbouring areas.<br>4. Damping down of all exposed soil surfaces with a water bowser or | Duration of operation | The implementation of the recommended mitigation measures will result in the minimisation of impacts to acceptable standards, thereby ensuring compliance with NEMA and Duty of Care as prescribed by NEMA. |

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| | | sprinklers when necessary to reduce dust.<br>5. The Contractor shall be responsible for dust control on site to ensure no nuisance is caused to the neighbouring communities.<br>6. A speed limit of 30km/h must not be exceeded on site.<br>7. Any complaints or claims emanating from the lack of dust control shall be attended to immediately by the Contractor.<br>8. Any dirt roads that are utilised by the workers must be regularly maintained to ensure that dust levels are controlled.<br><br>**Odour control**<br><br>9. Regular servicing of vehicles in order to limit gaseous emissions.<br>10. Regular servicing of onsite toilets to avoid potential odours. | | |

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| | | **Rehabilitation**<br><br>1. The Contractor should commence rehabilitation of exposed soil surfaces as soon as practical after completion of earthworks.<br><br>**Fire prevention**<br><br>2. No open fires shall be allowed on site under any circumstance. All cooking shall be done in demarcated areas that are safe and cannot cause runaway fires.<br>3. The Contractor shall have operational fire-fighting equipment available on site at all times. The level of fire-fighting equipment must be assessed and evaluated through a typical risk assessment process. | | |
| | Noise | 1. The mining activities must aim to adhere to the relevant noise | Duration of operation | The implementation of the recommended mitigation |

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| | | regulations and limit noise to within standard working hours in order to reduce disturbance of dwellings in close proximity to the development.<br>2. Pans, power plants, crushers, workshops and other noisy fixed facilities should be located well away from noise sensitive areas.<br>3. Truck traffic should be routed away from noise sensitive areas, where possible.<br>4. Noise levels must be kept within acceptable limits.<br>5. Noisy operations should be combined so that they occur where possible at the same time.<br>6. Mine workers to wear necessary ear protection gear.<br>7. Noisy activities should take place during allocated hours.<br>8. Noise from laborers to be controlled. | | measures will result in the minimisation of impacts to acceptable standards, thereby ensuring compliance with NEMA and Duty of Care as prescribed by NEMA. |

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| | | 9. Noise suppression measures should be applied to all equipment. Equipment should be kept orderly and where appropriate fitted with silencers which are kept in good working order. Should the vehicles or equipment not be in good working order, the Contractor may be instructed to remove the offending vehicle or machinery from the site<br>10. The Contractor must take measures to discourage laborers from loitering in the area and causing noise disturbance. Where possible laborers shall be transported to and from the site by the Contractor using contractors vehicles.<br>11. Implementation of enclosure and cladding of processing plants.<br>12. Applying regular and thorough maintenance schedules to equipment and processes. An | | |

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| | | increase in noise emission levels very often is a sign of the imminent mechanical failure of a machine. | | |
| | Impact on potential cultural, heritage artefacts and fossils. | 4. Any discovery artefacts should be reported to the nearest National Monuments office to comply with the National Heritage Resources Act (Act No 25 of 1999) and to DEFF.<br>G) Local museums as well as the South African Heritage Resource Agency (SAHRA) should be informed if any artefacts/ fossils are uncovered in the affected area.<br>H) The Contractor must ensure that his workforce is aware of the necessity of reporting any possible historical, archaeological or palaeontological finds to the ECO so that appropriate action can be taken.<br>I) Known sites should be clearly marked in order that they can be | Duration of operation | The implementation of the recommended mitigation measures will result in the minimisation of impacts to acceptable standards, thereby ensuring compliance with NEMA and Duty of Care as prescribed by NEMA. |

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| | | avoided. The workeforce should also be informed that fenced-off areas are no-go areas.<br>J) The ECO must also survey for heritage and paleontological artefacts during ground breaking and digging or drilling. He/she should familiarise themselves with formations and its fossils or a palaeontologist should be appointed during the digging and excavation phase of the development.<br>K) All activities which includes excavating, drilling or blasting must immediately ceased should heritage and/or paleontological artefacts uncovered and a specialist should be called in to determine proper management, mitigation, excavation and/or collecting measures.<br>L) Any discovered artefacts or fossils shall not be removed under any | | |

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| | | circumstances. Any destruction of a site can only be allowed once a permit is obtained and the site has been mapped and noted. Permits shall be obtained from SAHRA should the proposed site affect any world heritage/palaeontology sites or if any heritage/palaeontology sites are to be destroyed or altered.<br>M) Under no circumstances shall any artefacts be removed, destroyed or interfered with by anyone on the site; and contractors and workers shall be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or paleontological artefacts, as set out in the NHRA (Act No. 25 of 1999), Section 51. (1). | | |

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| Waste Management | | **Litter management**<br><br>1. Refuse bins should be made available and placed strategically to ensure that litter does not accumulate within the construction/mining site.<br>2. The Contractor must supply waste collection bins where such is not available and all solid waste collected shall be disposed of at registered/licensed landfill.<br>3. Good housekeeping practices should be implemented to regularly maintain the litter and rubble situation on the construction/mining site.<br>4. Where possible, all waste generated on site must be separated into glass, plastic, paper, metal and wood and recycled. An independent contractor can be appointed to conduct this recycling. | Duration of operation | The implementation of the recommended mitigation measures will result in the minimisation of impacts to acceptable standards, thereby ensuring compliance with NEMA and Duty of Care as prescribed by NEMA. |

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| | | 5. Littering by the employees must at all cost be avoided and where possible, contractor to put in place measures to prevent littering e.g. penalties for those that will be found littering. The ECO shall monitor the neatness of the work sites as well as the Contractor campsite.<br>6. Skip waste containers should be maintained on site. These should be kept covered and arrangements made for them to be collected regularly.<br>7. All waste must be removed from the site and transported to a landfill site promptly to ensure that it does not attract vermin or produce odours.<br>8. Where a registered waste site is not available close to the construction/mining site, the Contractor shall provide a method | | |

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| | | statement with regard to waste management.<br>9. A certificate of disposal shall be obtained by the Contractor and kept on file, if relevant.<br>10. Under no circumstances may solid waste be burnt on site.<br>11. All waste must be removed promptly to ensure that it does not attract vermin or produce odours.<br><br>**Hazardous waste**<br><br>12. All waste containing hazardous materials must be carefully stored as advised by the ECO, and then disposed of offsite at a licensed landfill site, where practical. Incineration may be used where relevant.<br>13. Contaminants to be stored safely to avoid spillage. | | |

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| | | 14. Machinery must be properly maintained to keep oil leaks in check.<br>15. All necessary precaution measures shall be taken to prevent soil or surface water pollution from hazardous materials used during construction/mining activities and any spills shall immediately be cleaned up and all affected areas rehabilitated.<br><br>**Sanitation**<br><br>16. The Contractor shall install mobile chemical toilets on the site.<br>17. Staff shall be informed to the fact that they should use these facilities at all times. No indiscriminate sanitary activities on site shall be allowed.<br>18. Toilets shall be serviced regularly and the ECO shall inspect toilets regularly. | | |

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| | | 19. Toilets should be no closer than 50m or above the 1:100 year flood line from any natural or manmade water bodies or drainage lines or alternatively located in a place approved of by the Engineer.<br>20. Under no circumstances may open areas, neighbor's fences or the surrounding bush be used as a toilet facility.<br>21. The contractor must ensure that long drop toilets not used, instead toilets connected to the sewage treatment plant must be used.<br>22. Potable water should be provided for all construction staff.<br><br>**Remedial actions**<br><br>23. Contaminated soil must be either excavated or treated on-site, this must depend on the nature and extent the spills. | | |

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| | | 24. Excavation of contaminated soil must involve careful removal of soil using appropriate tools/machinery to storage containers until treated or disposed of at a licensed hazardous landfill site.<br>25. The ECO must determine the precise method of treatment for polluted soil. This could involve the application of soil absorbent materials as well as oil-digestive powders to the contaminated soil.<br>26. In case spill occurs on an impermeable surface such as cement or concrete, the surface spill must be contained using oil absorbent material.<br>27. Where necessary, oil absorbent sheets or pads must be attached to leaky machinery or infrastructure.<br>28. Materials used for the remediation of petrochemical spills must be used according to product | | |

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| | | specifications and guidance for use.<br>29. Contaminated remediation materials must be carefully removed from the area of the spill so as to prevent further release of petrochemicals to the environment, and stored in adequate containers until appropriate disposal. | | |
| Water Use and Quality | Water pollution | **Water Use**<br><br>1. Develop a sustainable water supply management plan to minimize the impact to natural systems by managing water use, avoiding depletion of aquifers and minimizing impacts to water users.<br>2. Water must be reused, recycled or treated where possible.<br><br>**Water Quality** | | |

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| | | 3. The quality and quantity of effluent streams discharged to the environment including storm water should be managed and treated to meet applicable effluent discharge guidelines.<br>4. Discharge to surface water should not result in contaminant concentrations in excess of local ambient water quality criteria outside a scientifically established mixing zone.<br>5. Efficient oil and grease traps or sumps should be installed and maintained at refueling facilities, workshops, fuel storage depots, and containment areas and spill kits should be available with emergency response plans.<br><br>**Storm water**<br><br>6. The site must be managed in order to prevent pollution of drains, | | |

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| | | downstream watercourses or groundwater, due to suspended solids and silt or chemical pollutants.<br>7. Silt fences should be used to prevent any soil entering the storm water drains.<br>8. Temporary cut off drains and berms may be required to capture storm water and promote infiltration.<br>9. Promote a water saving mind set with construction/mining workers in order to Contractor ensure less water wastage.<br>10. New storm water construction must be developed strictly according to specifications from engineers in order to ensure efficiency.<br>11. Hazardous substances must be stored at least 20m from any water bodies on site to avoid pollution. | | |

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| | | 12. The installation of the storm water system must take place as soon as possible to attenuate storm water from the construction phase as well as the operation phase.<br>13. There should be a periodic checking of the site's drainage system to ensure that the water flow is unobstructed.<br>14. If a batching plant is necessary, run-off should be managed effectively to avoid contamination of other areas of the site. Untreated runoff from the batch plant must not be allowed to get into the storm water system or nearby streams, rivers or erosion channels or dongas.<br><br>**Groundwater resource protection**<br><br>15. Process solution storage ponds and other impoundments designed to hold non fresh water or un- | | |

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| | | treated process effluents should be lined and be equipped with sufficient wells to enable monitoring of water levels and quality.<br><br>**Sanitation**<br><br>16. Adequate sanitary facilities and ablutions must be provided for construction workers (1 toilet per every 10 workers).<br>17. The facilities must be regularly serviced to reduce the risk of surface or groundwater pollution.<br><br>**Concrete mixing**<br><br>18. Concrete contaminated water must not enter soil or any natural drainage system as this disturbs the natural acidity of the soil and affects plant growth. | | |

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| | | **Public areas**<br><br>19. Food preparation areas should be provided with adequate washing facilities and food refuse should be stored in sealed refuse bins which should be removed from site on a regular basis.<br>20. The Contractor should take steps to ensure that littering by construction workers does not occur and persons should be employed on site to collect litter from the site and immediate surroundings, including litter accumulating at fence lines.<br>21. No washing or servicing of vehicles on site. | | |

**G)** The method of monitoring the implementation of the impact management actions contemplated in paragraph (f);

**H)** Monitoring and reporting frequency;

**I)** An indication of the persons who will be responsible for the implementation of the impact management actions;

**J)** The time periods within which the impact management actions contemplated in paragraph (f) must be implemented;

**K)** The mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);

**L)** A program for reporting on compliance, taking into account the requirements as prescribed by the Regulations;

| 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 |
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| Clearance of vegetation | Loss or fragmentation of habitats | • Conduct regular internal audits<br>• Conduct regular external audits | • Environmental Manager<br>• Suitable qualified environmental auditor | Monitoring should be undertaken for duration of operations. Internal audits should be undertaken at least every 6 months. External audits should be undertaken by a suitably qualified auditor on an annual basis. Reports should be made available to the competent authority if required. |
| Mining of Manganese and iron ore and excavations | > Loss of top soil<br>> Erosion<br>> Air Pollution<br>>Noise | • Conduct regular internal audits<br>• Conduct regular external audits | • Environmental Manager<br>• Suitable qualified environmental auditor | Monitoring should be undertaken for duration of operations. Internal audits should be undertaken at least every 6 months. External audits should be undertaken by a suitably qualified auditor on an annual basis. Reports should be made available to the competent authority if required. Any archeological artifacts will |

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| | > Impact on potential cultural-, heritage artefacts and fossils | | | be reported if found during construction phase |
| Waste management | Pollution | • Conduct regular internal audits<br>• Conduct regular external audits | • Environmental Manager<br>• Suitable qualified environmental auditor | Monitoring should be undertaken for duration of operations. Internal audits should be undertaken at least every 6 months. External audits should be undertaken by a suitably qualified auditor on an annual basis. Reports should be made available to the competent authority if required. |
| Water Use and Quality | Water pollution | • Conduct regular internal audits<br>• Conduct regular external audits | • Environmental Manager<br>• Suitable qualified environmental auditor | Monitoring should be undertaken for duration of operations. Internal audits should be undertaken at least every 6 months. External audits should be undertaken by a suitably qualified auditor on an annual basis. Reports should be made available to the competent authority if required. |

## M. ENVIRONMENTAL AWARENESS PLAN

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

  **Murara Environmental Consultants Pty Ltd** will implement an Environmental Awareness Plan which will include various mechanisms for informing employees of environmental risks resulting from their work, including:

  - Induction training for full –time staff and contractors;
  - Training and skills development
  - On the job training regarding environmental issues
  - In-house training sessions to be held with relevant employees;

  The above measures will be implemented through an Environmental Communication Strategy to be implemented.

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

  **Murara Environmental Consultants (Pty) Ltd** will implement an incident reporting and reporting procedure in order to identify risks timeously and implement actions to avoid or minimize environmental impacts.

## N) Specific information required by the Competent Authority

No other requirements have been specified by competent authority and financial provisions will be submitted to the Department of minerals and energy and it will be reviewed annually.