



**mineral resources**

Department:  
Mineral Resources  
**REPUBLIC OF SOUTH AFRICA**

# **BASIC ASSESSMENT REPORT AND ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT**

Mining Permit Application for the Removal of Diamonds Alluvial and Diamond General near Christiana on a certain portion of 4.9 hectares on the Remaining Extent of Portion 1 of the farm Christiana Town & Townlands 325, Registration Division: HO, North West Province.

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

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## CLAUSE

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## 1. IMPORTANT NOTICE

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

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

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

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

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

## 2. Objective of the basic assessment process

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

- (a) determine the policy and legislative context within which the proposed activity is located and how the activity complies with and responds to the policy and legislative context;
- (b) identify the alternatives considered, including the activity, location, and technology alternatives;
- (c) describe the need and desirability of the proposed alternatives,
- (d) through the undertaking of an impact and risk assessment process inclusive of cumulative impacts which focused on determining the geographical, physical, biological, social, economic, heritage, and cultural sensitivity of the sites and locations within sites and the risk of impact of the proposed activity and technology alternatives on the these aspects to determine:
  - (i) the nature, significance, consequence, extent, duration, and probability of the impacts occurring to; and
  - (ii) the degree to which these impacts—
    - (aa) can be reversed;
    - (bb) may cause irreplaceable loss of resources; and
    - (cc) can be managed, avoided or mitigated;
- (e) through a ranking of the site sensitivities and possible impacts the activity and technology alternatives will impose on the sites and location identified through the life of the activity to—
  - (i) identify and motivate a preferred site, activity and technology alternative;
  - (ii) identify suitable measures to manage, avoid or mitigate identified impacts; and
  - (iii) identify residual risks that need to be managed and monitored.

## PART A SCOPE OF ASSESSMENT AND BASIC ASSESSMENT REPORT

### 3. Contact Person and correspondence address

#### a) Details of

##### i) Details of the EAPs

Name of Practitioner: Percy Sehaole

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e-mail address: [percy@milnex-sa.co.za](mailto:percy@milnex-sa.co.za)

Name of The Practitioner: Danie Labuschagne

Tel No.: (018) 011 1925

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##### ii) Expertise of the EAP.

###### (1) The qualifications of the EAP

(with evidence).

Danie Labuschagne holds a Master's Degree in Environmental Management and Geography (refer to **Appendix 1**)

Percy Sehaole holds a Master's Degree in Environmental Science (refer to **Appendix 1**)

###### (2) Summary of the EAP's past experience.

(Attach the EAP's curriculum vitae as **Appendix 2**)

Milnex 189 CC was contracted by Veronica Dineo Ntsekeletsa as the independent environmental consultant to undertake the Basic Assessment process for a mining permit of Diamond Alluvial & Diamonds General near Christiana on a certain portion of 4.9 hectares on the Remaining Extent of Portion 1 of the farm Christiana Town & Townlands 325, Registration Division: HO, North West Province. Milnex 189 CC does not have any interest in secondary developments that may arise out of the authorisation of the proposed project.

Milnex 189 CC is a specialist environmental consultancy with extensive experience in the mining industry which provides a holistic environmental management service, including environmental assessment and planning to ensure compliance with relevant environmental legislation. Milnex 189 CC benefits from the pooled resources, diverse skills and experience in the environmental and mining field held by its team that has been actively involved in undertaking environmental studies for a wide variety of mining related projects throughout South Africa. The

Milnex 189 CC team has considerable experience in environmental impact assessment and environmental management, especially in the mining industry.

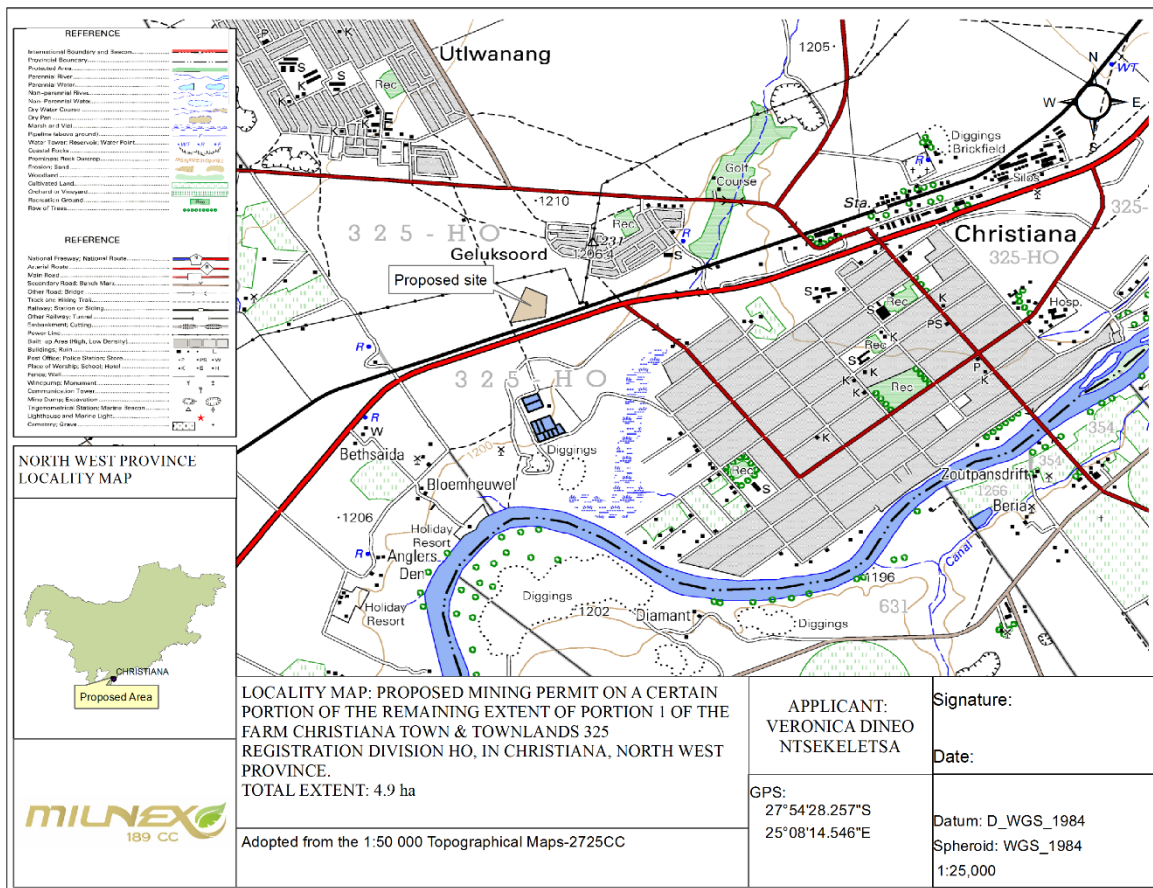
Danie Labuschagne & Percy Sehaole have experience consulting in the environmental field. Their key focus is on environmental assessment, advice and management and ensuring compliance to legislation and guidelines. They are currently involved in undertaking EIAs for several projects across the country (refer to **Appendix 2** for CV)

**b) Location of the overall Activity.**

<b>Farm Name:</b>	A certain portion of 4.9 hectares on the remaining extent of portion 1 of the farm Christiana Town & Townlands 325.
<b>Application area (Ha)</b>	4.9 Ha
<b>Magisterial district:</b>	HO
<b>Distance and direction from nearest town</b>	Adjacent (north) of Christiana.
<b>21 digit Surveyor General Code for each farm portion</b>	TOHO00000000032500000

**c) Locality map (Show nearest town, scale not smaller than 1:250000).**

A Locality map is attached in **Appendix 3**





equipment storage, sample storage, site office, access route <b>etc...etc...etc</b>  <b>E.g. for mining,-</b> 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.)		<b>applicable or affected.</b>	<b>(GNR 982, GNR 983 or GNR 984)</b>
Mining Permit for the removal of diamond alluvial & diamond general, including associated infrastructure, structures and earthworks.	4.9 Ha	X	GNR. 983 – Activity 21
The clearance of 4.9 hectares of indigenous vegetation.	4.9 Ha	X	GNR. 983 – Activity 27

**(ii) Description of the activities to be undertaken**

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

Veronica Dineo Ntsekeletsa has embarked on a process for applying for a mining permit near Christiana on a certain portion of 4.9 hectares on the Remaining Extent of Portion 1 of the farm Christiana Town & Townlands 325, Registration Division: HO, North West Province. Veronica Dineo Ntsekeletsa requires a mining permit in terms of NEMA and the Mineral and Petroleum Resources Development Act to mine diamonds alluvial & diamond general on a certain portion of 4.9 ha on the Remaining Extent of Portion 1 of the farm Christiana Town & Townlands 325.

(refer to a locality map attached in **Appendix 3**).

**Quantifying the surface area:**

Mining will be restricted to the 4.9 Ha applied for. For every 0.98 Ha there will be no more that 10 trenches at any given time, which will be dug.

$$4.9 \frac{\text{hectern}}{50 \text{ trenches}} = 0.098 \text{ Ha per trench}$$

- 4.9 Ha- (40m x 24.5m) trench = 10 trenches every hectare. The total area to be disturbed at any given time will be- 4 trenches x (40m x 24.5m) = 0.392 Ha at any given time
- No more than 0.392 Ha (4 Trenches) will be left as un-rehabilitated. Rehabilitation will be done concurrently.

Rehabilitation will be taking place continuously and therefore only a small area (0.392 Ha) will be left un-rehabilitated at the end of mining activities, which will require the amount provided in the quantum.

**Access roads**



Several existing roads and tracks already traverse the proposed mining site and where practicable, these roads will be used.

Temporary access roads may be established for repeated access to the site if the identified site cannot be accessed via existing roads and tracks, but this should be limited and the location thereof should be corresponded with and approved by the property owner.

According to the SANRAL, farm gravel roads are allowed to have the width of 2,5m each lane, therefore such lanes may be made for access. If access roads are made, they will be normal two track roads.

### **Water Supply**

Since 1 x 16 feet washing pans will be used, the amount of water for the pan will be 17 000 L/hour.

**Table 1:** Water Use Pan Size specifications for Alluvial Diamond Mining (DWS NC & FS, 2001).

<b>Pan size</b>	<b>Water/hour (m<sup>3</sup>)</b>	<b>Water/day(m<sup>3</sup>)</b>	<b>Gravel/hour (tons)</b>	<b>Gravel/day (ton)</b>
16	17	170	60	600

Additional water requirements related to the portable water supply for employees and workers.

### **Ablution**

Chemical toilets shall be used, no french drains and pits shall be permitted.

### **Storage of dangerous goods**

During the mining activities, limited quantities of diesel and fuel, oil and lubricants will be stored on site. These goods should be placed in a bunded area one and a half times the volume of the total amount of goods to be stored.

Types of lubricants will be dependent on the machines used, this will include diesel, fuel and oil. It should be noted that no more than 80 000 cubes metres of diesel may be stored on site

### **The alluvial diamond mining methodology:**

The process of alluvial diamond mining involves digging and sifting through mud, sand and gravel. Typically, diamonds come from geologic rock formations called Kimberlites. Kimberlite rock formations that contain diamonds are eroded over time by rivers and streams and can deposit diamonds in the sediments carried by those streams farther downstream from the original source rocks. These deposits are called alluvial diamond deposits. The locations of these alluvial diamond deposits are controlled by the surrounding topography, drainage patterns, and the location of the Kimberlites themselves.

Vegetation clearance takes place first from where stripping and stockpiling of topsoil. All topsoil (irrespective of depth) is stripped separately with an excavator and front-end loader and stockpiled next to the first pit. The topsoil will be stored in such a way that the minimum runoff and erosion will emanate from it. The topsoil will be stored in a pile; around the pile surface runoff trenches will be constructed to divert any runoff around the pile. The topsoil will be used for final rehabilitation when mining has reached its end of life span. Concurrent rehabilitation will also be done.

Alluvial mining requires a considerable amount of material (called the 'over-burden') to be removed first to get to the gravel bed underneath, where diamonds are found. Once the topsoil has been removed the overburden then stripped and placed adjacent the excavation.

Once the overburden has been removed the exposed diamondiferous gravel is stripped with an excavator and stockpiled on the side on the excavation and from where frond-end loaders haul it to the mineral processing plant, as needed (different location than excavations).

At the plant the gravel is fed into the primary conveyer by frond-end loaders. The gravel is fed by the conveyer into the rotating pans.

The total amount of water used for processing is between 10 000 and 18 000 litres an hour, depending on the size of the pan, of which 50% will be re-circulated from the open excavations in which the wet puddle is flowing and 50% is added by means of fresh water. The concentrate out of the pans goes directly into the steels bins that are sorted for final recovery on site.

The wet waste tailings coming out of the pans is pumped to open excavations and slimes dam, from where excess water is re-cycled.

**For backfilling and rehabilitation, the following procedures will be as follow:**

The coarse gravel (rough) sifted from the pans will be transported back by frond-end loaders towards all open pits for backfilling. During backfilling variation in the dumping sequence of materials will be followed to obtain better compaction and stability of the reclaimed gravel. After the rough and wet tailings are backfilled it will be followed by the overburden. This will ensure that the voids surrounding the coarse gravel will be filled up with finer sediments. The heavy vehicles will obtain compaction during backfilling stage. The above sequence will continue until the last pit is reached. The topsoil stored at the beginning of mining will now be utilised for final rehabilitation. The maximum areas that will be disturbed during the mining operation are very difficult to determine because of the varying depth of the excavations.

e) Policy and Legislative Context

<b>APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT</b> (a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process)	<b>REFERENCE WHERE APPLIED</b>	<b>HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT.</b>  (E.g. In terms of the National Water Act a Water Use License has/ has not been applied for)
<b>The Constitution of South Africa (Act No. 108 of 1996)</b>		The Constitution is the supreme law of the Republic and all law and conduct must be consistent with the Constitution. The Chapter on the Bill of Rights contains a number of provisions, which are relevant to securing the protection of the environment. Section 24 states that “everyone has the right to (a) an environment that is not harmful to their health or well-being and (b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that – (i) prevent pollution and ecological degradation; (ii) promote conservation; and (iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development. The Constitution therefore, compels government to give effect to the people’s environmental right and places government under a legal duty to act as a responsible custodian of the countries environment. It compels government to pass legislation and use other measures to protect the environment, to prevent pollution and ecological degradation, promote conservation and secure sustainable development.
<b>The National Environmental Management Act (Act No. 107 of 1998)</b>	S24(1) of NEMA S28(1) of NEMA	NEMA provides for co-operative governance by establishing principles and procedures for decision-makers on matters affecting the environment. An important function of the Act is to serve as an enabling Act for the promulgation of legislation to effectively address integrated environmental management. Some of the principles in the Act are accountability; affordability; cradle to grave management; equity; integration; open information; polluter pays; subsidiary; waste avoidance and minimisation; co-operative governance; sustainable development; and environmental protection and justice.  The mandate for EIA lays with the National Environmental Management Act (107 of 1998) and the EIA Regulations No. 982, 983, 984, and 985 promulgated in terms of Section 24 of NEMA. The EIA Regulations determine that an Environmental Authorisation is required for certain listed activities, which might have a detrimental effect on the environment. This EIA was triggered by activity 21, 24(ii) and 27 listed in Regulation R983, which requires a ‘basic assessment process.’
<b>The National Water Act (Act No. 36 of 1998)</b>	S21	Sustainability and equity are identified as central guiding principles in the protection, use, development, conservation, management and control of water resources. The intention of

		<p>the Act is to promote the equitable access to water and the sustainable use of water, redress past racial and gender discrimination, and facilitate economic and social development. The Act provides the rights of access to basic water supply and sanitation, and environmentally, it provides for the protection of aquatic and associated ecosystems, the reduction and prevention of pollution and degradation of water resources.</p> <p>As this Act is founded on the principle that National Government has overall responsibility for and authority over water resource management, including the equitable allocation and beneficial use of water in the public interest, a person can only be entitled to use water if the use is permissible under the Act. Chapter 4 of the Act lays the basis for regulating water use.</p>
<p><b>Management: Air Quality Act (Act No. 39 of 2004)</b></p>	<p>S21</p>	<p>The object of this Act is to protect the environment by providing reasonable measures for the protection and enhancement of the quality of air in the Republic; the prevention of air pollution and ecological degradation; and securing ecologically sustainable development while promoting justifiable economic and social development.</p> <p>Regulations No. R248 (of 31 March 2010) promulgated in terms of Section 21(1) (a) of the National Environmental Management Act: Air Quality Act (39 of 2004) determine that an Atmospheric Emission License (AEL) is required for certain listed activities, which result in atmospheric emissions which have or may have a detrimental effect on the environment. The Regulation also sets out the minimum emission standards for the listed activities. It is not envisaged that an Atmospheric Emission License will be required for the proposed development.</p>
<p><b>The National Heritage Resources Act (Act No. 25 of 1999)</b></p>		<p>The Act aims to introduce an integrated and interactive system for the management of the heritage resources, to promote good government at all levels, and empower civil society to nurture and conserve heritage resources so that they may be bequeathed to future generations and to lay down principles for governing heritage resources management throughout the Republic. It also aims to establish the South African Heritage Resources Agency together with its Council to co-ordinate and promote the management of heritage resources, to set norms and maintain essential national standards and to protect heritage resources, to provide for the protection and management of conservation-worthy places and areas by local authorities, and to provide for matters connected therewith.</p> <p>The Act protects and manages certain categories of heritage resources in South Africa. For the purposes of the Heritage Resources Act, a "heritage resource" includes any place or object of cultural significance. In this regard the Act makes provision for a person undertaking an activity listed in Section 28 of the Act to notify the resources authority. The</p>

		resources authority may request that a heritage impact assessment be conducted if there is reason to believe that heritage resources will be affected.
<b>Conservation of Agricultural Resources Act (Act No. 85 of 1983)</b>		<p>The objective of the Act is to provide for control over the utilization of the natural agricultural resources of the Republic in order to promote the conservation of the soil, the water sources and the vegetation and the combating of weeds and invader plants; and for matters connected therewith.</p> <p>Consent may be required from the Department of Agriculture in order to confirm that the proposed development is not located on high potential agricultural land.</p>
<b>Mineral and Petroleum Resources Development Act (Act No. 28 of 2002)</b>		<p>The Minerals and Petroleum Resources Development Act identifies the state as the official custodian of South Africa's Mineral and Petroleum Resources. Therefore all activities relating to the reconnaissance, prospecting rights, mining rights, mining permits and retention permits are regulated by the State.</p> <p>A mining permit application has been lodge with the Department of Mineral Resources – North West Province</p>
<b>National Infrastructure Plan</b>		<p>The National Government adopted a National Infrastructure Plan in 2012. With the plan they aim to transform the South African economic landscape while simultaneously creating significant numbers of new jobs, and strengthening the delivery of basic services.</p> <p>Government will over the three years from 2013/14 invest R827 billion in building and upgrading existing infrastructure.</p> <p>These investments will improve access by South Africans to healthcare facilities, schools, water, sanitation, housing and electrification. On the other hand, investments in the construction of ports, roads, railway systems, electricity plants, hospitals, schools and dams will contribute to faster economic growth.</p> <p>This mining activity will indirectly contribute to the growing of the South African economy by supplying SANRAL with material to build and upgrade road infrastructure.</p>
<b>North West Province Growth and Development Strategy</b>		<p>The Strategy (PGDS) provides a framework for integrated and sustainable growth and economic development for the province and its people over the next ten years. It addresses the formulation of a common vision, goals and objectives of what should be achieved and how the provincial government and its social partners should achieve its objectives.</p> <p>The PGDS notes that the NWP is a medium-size province, covering ~10% of the total national surface area, accounting for ~8% of the national population, and contributing ~7%</p>

		<p>to the national economy. With the exception of the mining sector (~23.5% of provincial GDP in 2002), private sector activity in the NWP is very modest. Other development challenges include low population densities; inadequate infrastructure, and enormous service delivery backlogs; a predominantly poor population with high levels of illiteracy and dependency; great inequalities between rich and poor, and disparities between urban and rural; and the HIV/Aids pandemic.</p> <p>Both the primary immediate and long term objectives of the PGDS are therefore to address poverty and unemployment, while simultaneously improving the low level of expertise and skills. Additional objectives include promoting equal and fair access to opportunities and assets; enhancing competitiveness, profitability and SMME development; and explore opportunities for small-scale mining and intensive job creation.</p>
<p><b>National Forest Act 84 of 1998</b></p>		<p>The protection, sustainable management and use of forests and trees within South Africa are provided for under the National Forests Act (Act 84 of 1998).</p> <p>Prohibition on destruction of trees in natural forests</p> <p>(1) No person may -</p> <p>(a) cut, disturb, damage or destroy any indigenous tree in a natural forest; or</p> <p>(b) possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any tree, or any forest product derived from a tree contemplated in paragraph (a), except in terms of-</p> <p>(i) a licence issued under subsection (4) or section 23; or</p> <p>(ii) an exemption from the provisions of this subsection published by the Minister in the <i>Gazette</i> on the advice of the Council.</p>
<p><b>National Environmental Management: Protected Areas Act 57 of 2003</b></p>		<p>This Act provides for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes. It also seeks to provide for the sustainable utilization of protected areas and to promote participation of local communities in the management of protected areas.</p>

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

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

**Need for the proposed activity**

South Africa has the most diverse range of diamond deposits in the world. Deposits include open pit and underground kimberlite pipe/dyke/fissure mining, alluvial mining, as well as on and offshore marine mining. South Africa produced 6,139,682.00 carats in 2009. South Africa produces in the region of 5% of global production and is ranked 7th in the world in terms of rough diamond production.

A severe downturn was experienced in the second half of 2008, but both production and prices are showing signs of stabilisation. This recovery has encouraged junior diamond miners to resume production and to continue with proposed expansion projects

The establishment of the mining activity will significantly contribute to achieving this objective and will also address some of the objectives identified by the Lekwa-Teemane Local Municipality Integrated Development Plan (Draft IDP, 2017/22).

**Desirability of the proposed activity**

The facility's contribution towards development and the associated benefits to society in general is discussed below:

- **Economic growth** - South Africa's total reserves remain some of the world's most valuable, with an estimated worth of R20.3-trillion. Overall, the country is estimated to have the world's fifth-largest mining sector in terms of GDP value.

It has the world's largest reserves of manganese and platinum group metals (PGMs), according to the US Geological Survey, and among the largest reserves of gold, diamonds, chromite ore and vanadium.

With South Africa's economy built on gold and diamond mining, the sector is an important foreign exchange earner, with gold accounting for more than one-third of exports. In 2009, the country's diamond industry was the fourth largest in the world.

Mining is a cornerstone of the economy, making a significant contribution to economic activity, job creation and foreign exchange earnings. Mining and its related industries are critical to South Africa's socio-economic development.

- **Social benefits** - Alluvial diamond mines have been significant employers of local communities and provide necessary services to these communities

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

**Location of the site**

The location of the site is preferred due to the expected presence of shallow diamonds. Access to the site will be obtained from a local gravel road off the R506 between Christiana and Jan Kempdorp.

### Preferred activity

The mining of diamonds alluvial and diamonds general is one of the optimum preferred activities for the site. The other might be livestock grazing, however the impact thereon should be limited. The shallow diamond deposits make the site ideal for alluvial diamond and diamonds general mining. The mine will provide significantly more job opportunities.

### Technology alternatives

In terms of the technologies proposed, these have been chosen based on the long term success of their mining & prospecting history. The mining activities is dependent on the preceding phase as previously discussed, therefore no alternatives are indicated.

The preferred technology for the proposed mining activity, will be to remove the diamond bearing gravel with an excavator, depositing it in the 10 – 18 feet rotary pan(s) to be washed and sorted.

#### Pros & Cons of the alternative **Dense Media Separation (DMS)**

<b>Advantages</b>	<b>Disadvantages</b>
DMS plants is used mostly for kimberlite deposits	10 times more expensive than Rotary pan
	Water consumption is high
	Operating costs are expensive

In a Dense Media Separation (DMS) plant, powdered ferrosilicon (an alloy of iron and silicone) is suspended in water to form a fluid near the density of diamond (3.52 g/cm<sup>3</sup>), to which the diamond bearing material is added to begin the separation process of the heavier minerals from the lighter material. Additional separation of the denser material occurs by centrifuge in “cyclones” that swirl the mixture at low and high speeds, forcing the diamonds and other dense minerals to the walls and then out the bottom of the cyclone. Waste water rises at the center of the cyclones and is sucked out and screened to remove waste particles. The DMS process results in a concentrate that generally weighs less than one percent of the original material fed into the plant at the beginning of the process.

#### Pros & Cons of the alternative **Rotary Pan Plants**

<b>Advantages</b>	<b>Disadvantages</b>
More cost effective	The industry perception that Rotary Pan Plants yield poorer diamond recoveries
Readily available	
Generate more work opportunities	
Consume less water	
Rotary Pan Plants are most often used when mining alluvial deposits	

In a Rotary Pan plant, crushed ore, when mining kimberlite, or alluvial gravel and soil is mixed with water to create a liquid slurry called “puddle” which has a density in the 1.3 to 1.5 g/cm<sup>3</sup> range. The mix is stirred in the pan by angled rotating “teeth”. The heavier minerals, or “concentrate”, settle to the bottom and are pushed toward an



extraction point, while lighter waste remains suspended and overflows out of the centre of the pan as a separate stream of material. The concentrate, representing just a small percentage of the original kimberlite ore or alluvial gravels, is drawn off for final recovery of the diamonds.

Both methods are in actual fact used for bulk material reduction and require a further process for the final diamond recovery however, for this project the Rotary Pan will be used.

**h) Full description of the process followed to reach the proposed preferred alternatives within the site.**

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

**i) Details of the development footprint alternatives considered.**

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

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

**Consideration of alternatives**

The DEAT 2006 guidelines on 'assessment of alternatives and impacts' proposes the consideration of four types of alternatives namely, the no-go, site, activity, and technology alternatives. It is however, important to note that the regulation and guidelines specifically state that only 'feasible' and 'reasonable' alternatives should be explored. It also recognizes that the consideration of alternatives is an iterative process of feedback between the developer, the EAP and Interested and affected parties, which in some instances culminates in a single preferred project proposal. The following sections explore each type of alternative in relation to the proposed activity.

• **Location alternatives**

This alternative asks the question, if there is not, from an environmental perspective, a more suitable location for the proposed activity. No other properties have at this stage been secured by Veronica Dineo Ntsekeletsa in the Christiana area to potentially mine diamond alluvial & diamond general. From a local perspective, a certain portion of 4.9 hectares on the Remaining Extent of Portion 1 of the farm Christiana Town & Townlands 325, is preferred due to the sites underlying geology and the shallowness of the rock bed to the surface as well as site access (i.e. to facilitate the movement of machinery, equipment, infrastructure and people and the transport of the aggregate to the designated areas).

The proposed development falls within an area used for grazing and the site is therefore considered to have limited environmental sensitivity as a result. The National Department of Agriculture (2006) classified land capability into two broad categories, namely land suited to cultivation (Classes I – IV) and land with limited use, generally not suited to cultivation (Classes V – VIII). The site falls within Class V and therefore the agricultural potential of the



One hectare of surface area will be disturbed at any one time of the project, the lifetime of the project is approximately 3 years. It is foreseen that approximately 60 tons of diamond bearing gravel will be removed, from every hectare of the proposed mining activity, which is 4.9 hectares in extent. The facility will be operational from 8 A.M. to 5 P.M., Monday to Friday, but may working hours may extend to 6 P.M. and Saturdays. It is however possible that the lifetime of the project can be prolonged by a year or two and that the facility can become operational for prolonged hours or over weekends, depending on the diamond yield of the gravel.

- **No-go alternative**

This alternative considers the option of 'do nothing' and maintaining the status quo. The description provided in section H of this report could be considered the baseline conditions (status quo) to persist should the no-go alternative be preferred. Should the proposed activity not proceed, the site will remain unchanged as vacant municipality land.

- ii) **Details of the Public Participation Process Followed**

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

### **Advertisement and Notices**

- 1. **Newspaper advertisement**

Since the proposed development is unlikely to result in any impacts that extent beyond the municipal area where it is located, it was deemed sufficient to advertise in a local newspaper. An advertisement was placed in English in the local newspaper (Stellalander) on the **22 March 2017** (see **Appendix 6**) notifying the public of the EIA process and requesting Interested and Affected Parties (I&APs) to register with, and submit their comments to Milnex 189 CC. I&APs were given the opportunity to raise comments within 30 days of the advertisement.

**NOTICE OF APPLICATION FOR A MINING PERMIT  
AND SUBSEQUENT ENVIRONMENTAL IMPACT  
ASSESSMENT**

Notice is given in terms of Section 27 of the Mineral and Petroleum Resources Development Act (Act 28 of 2002) and Regulations 3, 14 and 51 of the Regulations published in Government Notice GN R527, & Notice is given, in terms of the EIA regulations published in Government Notice No. R982 under Section 39-44 of the National Environmental Management Act (Act No. 107 of 1998) of the intent to carry out an **Environmental Impact Assessment** (i.t.o. Listing Notice 1– G.N. R984) of the intent to carry out the above mentioned activity.

- ❖ **Project title:** Mining Permit application of **Veronica Dineo Ntsekeletsa** for the mining of Diamonds Alluvial & Diamonds General near Christiana on a certain portion of 4.9 hectares on the Remaining Extent of Portion 1 of the farm Christiana Town & Townlands 325, Registration Division: HO, North West Province.
- ❖ **Project description:** Diamond Alluvial & Diamonds General Mining Permit, associated infrastructure and earthworks on a certain portion of 4.9 hectares on the Remaining Extent of Portion 1 of the farm Christiana Town & Townlands 325, Registration Division: HO, North West Province. Situated within the Lekwa-Teemane Local Municipality area of jurisdiction. The property is located adjacent (north) of Christiana.
- ❖ **Size of site:** The site will be 4.9 hectares in extent
- ❖ **Proponent:** **Veronica Dineo Ntsekeletsa**
- ❖ **DMR ref:** **NW30/5/1/3/2/10472MP**
- ❖ **Coordinates:** 27°54'23.21"S, 25° 8'13.53"E; 27°54'32.29"S, 25° 8'9.43"E;  
27°54'30.77"S, 25° 8'18.55"E;  
27°54'25.44"S, 25° 8'18.93"E

**Public Meeting**  
**Date:** 11 April 2017  
**Time:** 10:00a.m. – 11:00a.m.  
**Place:** Next to the "Welcome to Geluksoord" red and white board, at the entrance.

**Any inquiries/objections must be lodged in writing or verbally if unable to write to the below mentioned consultants**

- ❖ **Consultants:** Danie Labuschagne/Percy Sehaole  
Milnex 189 CC  
Tel: (018) 011 1925  
Fax: 087 231 7021  
E-mail: [danie@milnex-sa.co.za](mailto:danie@milnex-sa.co.za) / [percy@milnex-sa.co.za](mailto:percy@milnex-sa.co.za)  
Postal Address: PO Box 1088, Schweizer-Reneke, 2526

The **Environmental Impact Assessment** application will be submitted to the Department of Mineral Resources. In order to ensure that you are identified as an interested and/or affected party please submit your name, contact information and interest in the matter, in writing or verbally to the contact person given above, by or within **30 days of this advertisement**.

Figure 4: Press advertisement

## 2. Site notices

Site notices were placed on site in English on the **15 March 2017** to inform surrounding communities and immediately adjacent landowners of the proposed development. I&APs were given the opportunity to raise comments. Photographic evidence of the site notices is included in **Appendix 6** and below are the coordinates where the multiple site notices were placed.

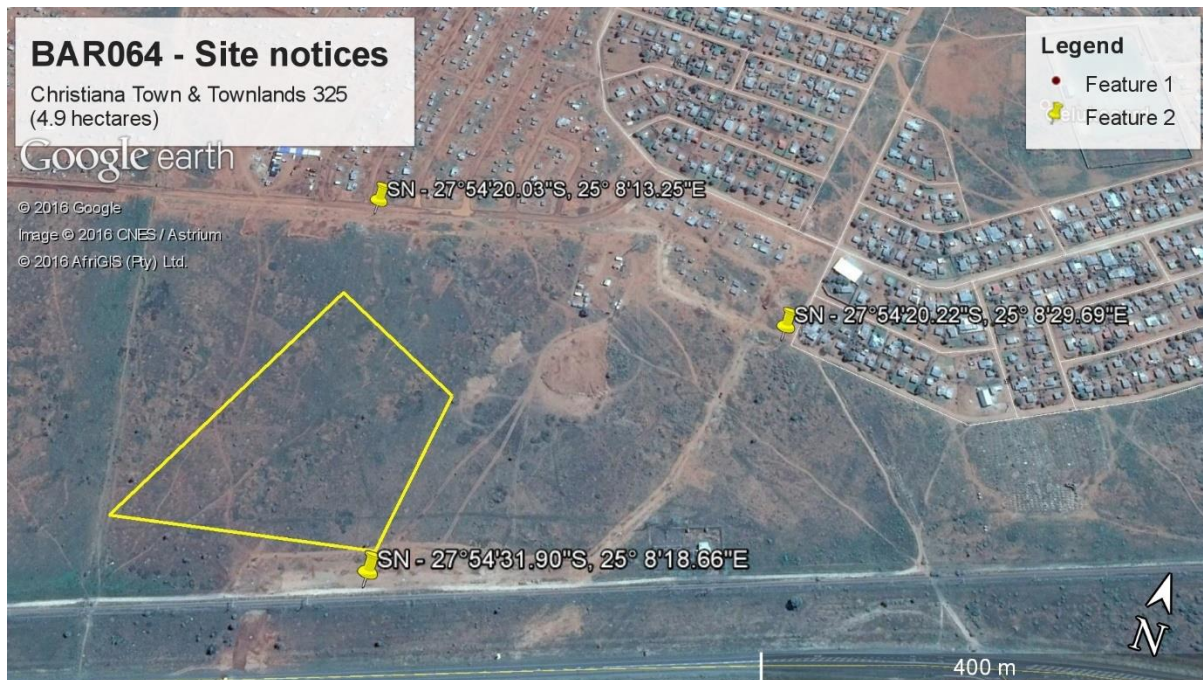


Figure 5: Site notices coordinates

#### Direct notification and circulation of BAR to identified I&APs

Identified I&APs, including key stakeholders representing various sectors, are directly informed of the proposed development and the availability of the Basic Assessment Report via registered post on **16 March 2017** and were requested to submit comments by **20 April 2017 (30 days)**. A copy of the report is also available at the Milnex offices in Schweizer-Reneke, 4 Botha Street, Schweizer-Reneke and Potchefstroom (Waterberry Street, Waterberry Square, 1st floor, Office 5B, Potchefstroom), between 7:30AM and 5PM, Monday to Friday. For a complete list of stakeholder details and for proof of registered post see **Appendix 6**. The consultees included:

- Department of Rural, Environmental and Agricultural Development, North West (READ)
- Department of Water & Sanitation
- North West Department of Mineral Resources (DMR)
- North West Department of Agriculture
- Provincial Heritage Resources Agency (PHRA), North West
- Wildlife and Environment Society of South Africa (WESSA)
- North West Department of Public Works, Roads and Transport (DPWRT)
- North West Department of Agriculture, Forestry, and Fisheries (DAF)
- National Department of Agriculture, Forestry, and Fisheries (DAFF)
- Dr. Ruth Segomotsi Mompoti District Municipality
- Municipal Manager at the Lekwa-Teemane Local Municipality
- Local Councilor at the Lekwa-Teemane Local Municipality

It was expected from I&APs to provide their inputs and comments within 30 days after receipt of the notification or Basic Assessment Report. All comments received was included in the final Basic Assessment Report.

### Direct notification of surrounding land owners and occupiers

Written notices and the availability of the Basic Assessment Report are also provided to all surrounding land owners and occupiers on **16 March 2017**. The surrounding land owners were given the opportunity to raise comments by **20 April 2017**. For a list of surrounding land owners see **Appendix 6**.

Written notices and the availability of the Basic Assessment Report are also provided to the community on **15 March 2017**. The community were given the opportunity to raise comments by **19 April 2017 (30 days)**. For proof of handing out the letter see **Appendix 6**.

### **3. Consultation**

All I&AP's are invited to attend the public meeting The Public Meeting is scheduled for the **11 April 2017 at 10:00am–11:00am** next to the "Welcome to Geluksoord" red and white board entrance, at the coordinates mentioned below. The public meeting is an opportunity to share information regarding the proposed development and provide I&APs with an opportunity to raise any issues and provide comments. The coordinates and directions (figure 1) of the public meeting follows below.

#### Coordinates

27°54'1.12"S  
25° 8'43.61"E

#### Directions from Christiana

- In Christiana get on Voortrekker Street/R708 and head northwest toward William Alexander Street for 3.1km
- After 3.1km at the "Welcome to Geluksoord" red and white board Milnex personnel will be waiting.



**Figure 6:** Directions to public meeting

The following key stakeholders and surrounding land owners were also directly informed of the public meeting via registered post, **16 March 2017**:

- Department of Rural, Environmental and Agricultural Development, North West (READ)
- Department of Water & Sanitation
- North West Department of Mineral Resources (DMR)
- North West Department of Agriculture
- Provincial Heritage Resources Agency (PHRA), North West
- Wildlife and Environment Society of South Africa (WESSA)
- North West Department of Public Works, Roads and Transport (DPWRT)
- North West Department of Agriculture, Forestry, and Fisheries (DAF)
- National Department of Agriculture, Forestry, and Fisheries (DAFF)
- Dr. Ruth Segomotsi Mompoti District Municipality
- Municipal Manager at the Lekwa-Teemane Local Municipality
- Local Councilor at the Lekwa-Teemane Local Municipality
- Land Owner 1: Lekwa-Teemane Local Municipality
- Surrounding Landowner: Lekwa-Teemane Local Municipality
- Surrounding Landowner: Transnet Ltd
- Surrounding Landowner: Mr Petrus Jacobus de Lange
- Surrounding Landowner: Mr Palolo Ananias Radebe
- Surrounding Landowner: Mr Leslie Arthur Bosman
- Surrounding Landowner: Mr Frans Jacobus Clarence

The interested and affected parties (I & AP's) were given an opportunity to register via site notice, press advert and letters and no one registered.

The Milnex representative was Mr. Mandi Sibanyoni and no I & AP's attended the public meeting.

The attendance register is attached as **appendix 6**.

### **3. Issues Raised by Interested and Affected Parties**

Comments received are recorded on the table below

**i. Summary of issues raised by I&APs**  
 (Complete the table summarising comments and issues raised, and reaction to those responses)

Interested and Affected Parties		Date Comments Received	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
List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted.					
Organisation	Contact person				
<b>Land Owner</b>					
Christiana Town and Townlands 1/325	Lekwa-Teemane Local Municipality	28/03/2017		Email sent from Ms. Anica Nieuwoudt of Milnex 189 CC on 28/03/2017 requesting three possible dates for a meeting to be held between Mr. Lesie, Mr Japie Loubser of Milnex 189 CC and the client.	
		10/04/2017		Email sent 10/04/2017 follows up on the email sent on 28/03/2017.	
		18/04/2017		Email sent 18/04/2017 follows up on the email sent on 10/04/2017.	
		25/04/2017		Email sent 25/04/2017 follows up on the email sent on 18/04/2017.	
	Lekwa-Teemane Local Municipality: Nono Masilo	05/05/2017		Proof of letter hand delivered on 05/05/2017	
	Lekwa-Teemane Local Municipality: Mr. Mokgethe Ratlhogo	10/05/2017		Meeting was held on 10/05/2017 at 09:00 in regards of the proposed application to consult with the landowner which is the Lekwa-Teemane Local Municipality.  The details of the project were discussed during the meeting. A map of the area was presented during the meeting.	



				<p>Mr. Rathlogo of the Lekwa-Teemane Local Municipality explained that he will speak with the mayor, and it was mentioned that the property would be used for agricultural activities.</p> <p>Mr. Rathlogo explained that he was to meet up with the council on 22/05/2017 and discuss this project.</p>	
		17/05/2017		<p>Email sent 17/05/2017 stating the following:</p> <p>We refer to the meeting held at your offices dated 10 May 2017.</p> <p>As mentioned during the meeting we attach hereto all correspondence documents regarding the matter for the council meeting to be held 22 May 2017.</p> <p>Please do not hesitate to contact us if any further information is needed.</p> <p>We await your response herein.</p>	
		09/06/2017		<p>Email sent 09/06/2017 follows up on email sent 17/05/2017 and ask if the council meeting has been held.</p>	
<b>Landowners or lawful occupiers on adjacent properties</b>					
Christiana Town and Townlands 39/325	Lekwa-Teemane Local Municipality – Municipal Manager: Mr Ndoda Mgengo		No comments received		
Christiana Town and Townlands 45/325	Transnet Ltd: Geo-Spatial, Mr. Raymond Lehloma	22/05/2017	Raymond requested kml files for the proposed application from the EAP on 22/05/2017.	The EAP sent Raymond the requested kml files on 22/05/2017	
Bloemheuvel 8/327	Mr Petrus Jacobus De Lange		No comments received		
Bloemheuvel 28/327	Mr Palolo Ananias Radebe		No comments received		

Bloemheuvel 32/327 & 33/327	Mr Leslie Arthur Bosman		No comments received	-	
Bloemheuvel 35/327	Mr Frans Jacobus Clarence		No comments received	-	
<b>The Municipality in which jurisdiction the development is located</b>					
Lekwa-Teemane Local Municipality	Municipal Manager: Mr Ndoda Mgengo		No comments received	-	
<b>Municipal councilor of the ward in which the site is located</b>					
Lekwa-Teemane Local Municipality	Ward 7 Councilor		No comments received	-	
<b>Organs of state having jurisdiction</b>					
Department of Rural, Environmental and Agricultural Development, North West (READ)	Ouma Skosana		No comments received	-	
The Department of Water & Sanitation (DWS)	Mr. Abe Abrahams & Me. Lindiwe Franks		No comments received	-	
NW Department of Agriculture (Dept. of Agric.)	Ms. Bonolo Mohlakoana		No comments received	-	
Provincial Heritage Resources Agency (PHRA) North West	Mr. Mothabane Mosiane		No comments received	-	
Department of Mineral Resources – North West	Regional Manager: Mineral Regulation, North West Region	10/03/2017	<p>Letter dated 10/03/2017 states that the application has been acknowledged.</p> <p>The office has evaluated the application and you are requested to:</p> <ol style="list-style-type: none"> <li>Consult with every organ of state.</li> <li>A letter from the pertinent heritage authority is requested in order to make nor issue a decision in terms of the application.</li> <li>To consult with the landowner and interested and affected parties and submit the record of the public</li> </ol>	-	

			<p>participation undertaken and results thereof to the office.</p> <p>d) In case of the tribal authority, you are required to ensure that proof of consultation of the community concerned is supported by a resolution which is taken in a meeting attended/facilitated by the Department of Rural Development and Land Reform.</p> <p>e) Submit 3 hard copies of Basic Assessment Report and Environmental Management Programme to the office and one soft copy on SAMRAD System within 90 days from lodgement date of your application with the above-mentioned information.</p> <p>Acknowledgement of your application for environmental authorisation does not grant you the right to commence with the mining activities.</p> <p>Any person operating without having Environmental Authorisation will be in contravention of section 49A (1) of the National Environmental Management Act, 1998 (Act No.107 of 1998) and would be guilty of an offence in terms of the relevant Act.</p> <p>Failure to submit the documents as requested and failure to adhere to the timeframes as stipulated shall result in your application being considered as having lapsed</p> <p>The application has been assigned to Mr. Tshilidzi Phalala who could be reached at the following contact details: Tel-(018) 487 4300/4388</p>	
	Mr. Tshilidzi Phalala	31/03/2017	<p>Letter dated 31/03/2017 states that the application has been accepted.</p> <p>Kindly note that you are requested to consult with the Department of Land Affairs if the land is state owned or</p>	

			<p>in the event that the land is subject to land restitution before or on the 18th May 2017.</p> <p>Acceptance of your application does not grant you the right to commence with mining operations.</p> <p>Failure to submit the documents as requested and failure to adhere to the timeframes as stipulated shall result in your application being considered as having lapsed</p>		
Department of Public Works, Roads and Transport in NW (DPWRT)	Director: Strategic Asset Management	26/04/2017	Letter dated 26/04/2017 states that the Department has noted contents of your application and has no objection in this regard. A Deed Search was conducted on the property and it is not registered.		
Department of Agriculture and Forestry (Potchefstroom) (DAF)	Mr. Maurice Vugeya Mrs Mpho Gumula		No comments received		
National Department of Agriculture Forestry and Fisheries (DAFF)	To whom it may concern		No comments received		
Department of Rural Development and Land reform	Lengane Bogatsu	27/03/2017		Email sent 27/03/2017 is proof of land claims consultation.	
		15/05/2017		Email sent on 15/05/2017 to follow up on the requested land claims.	
<b>Other-</b>					
Dr. Ruth Segomotsi Mompoti District	Municipal Manager: Zebo Tshetlho	-	No comments received	-	
WESSA (National Office)	To whom it may concern	-	No comments received	-	

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

**(1) Baseline Environment**

The baseline environment is described with specific reference to geotechnical conditions, ecological habitat and landscape features, Soil, land capability and agricultural potential, climate and the visual landscape.

**Landowner consent**

Proof of landowner consultation (see **Appendix 6**)

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

**Geology and Soils**

**Geotechnical conditions**

According to Mucina and Rutherford (2006) the site is underlined Andestic lavas of the Allanridge Formation in the north and west and fine-grained sediments of the Karoo Supergroup in the south and east. Deep (0.6 – 1.2m) sandy to loamy soils of the Hutton soil form (Ae and Ah land types) on slightly undulating sandy plains.

**Ecological habitat and landscape features**

The proposed portion falls within vegetation unit SVk 4, which is known as the Kimberley Thornveld. The Kimberley Thornveld is part of the Eastern Kalahari Bushveld Bioregion, which is a sub-bioregion for the Savanna Biome.

According to Mucina and Rutherford (2006:516), the Kimberley Thornveld vegetation covers the North West, Free State and Northern Cape Provinces: Most of the Kimberley, Hartswater, Bloemhof and Hoopstad Districts as well as substantial parts of the Warrenton, Christiana, Taung, Boshof and to some extent the Barkley West District. This thornveld is situated on an altitude of 1050m – 1400m.

Mucina and Rutherford (2006:517) also states that the conservation of this thornveld type, is Least Threatened with a target of 16%. Only 2% of this thornveld is statutorily conserved in Vaalbos National Park and in Sanveld, Bloemhof Dam and S.A. Lombard Nature Reserve. As much as 18% is already transformed, mostly by cultivation. Low erosion is associated with this type of thornveld. The area is mostly used for cattle farming or game ranching. Overgrazing leads to encroachment of *Acacia mellifera* subsp. *detinens*.

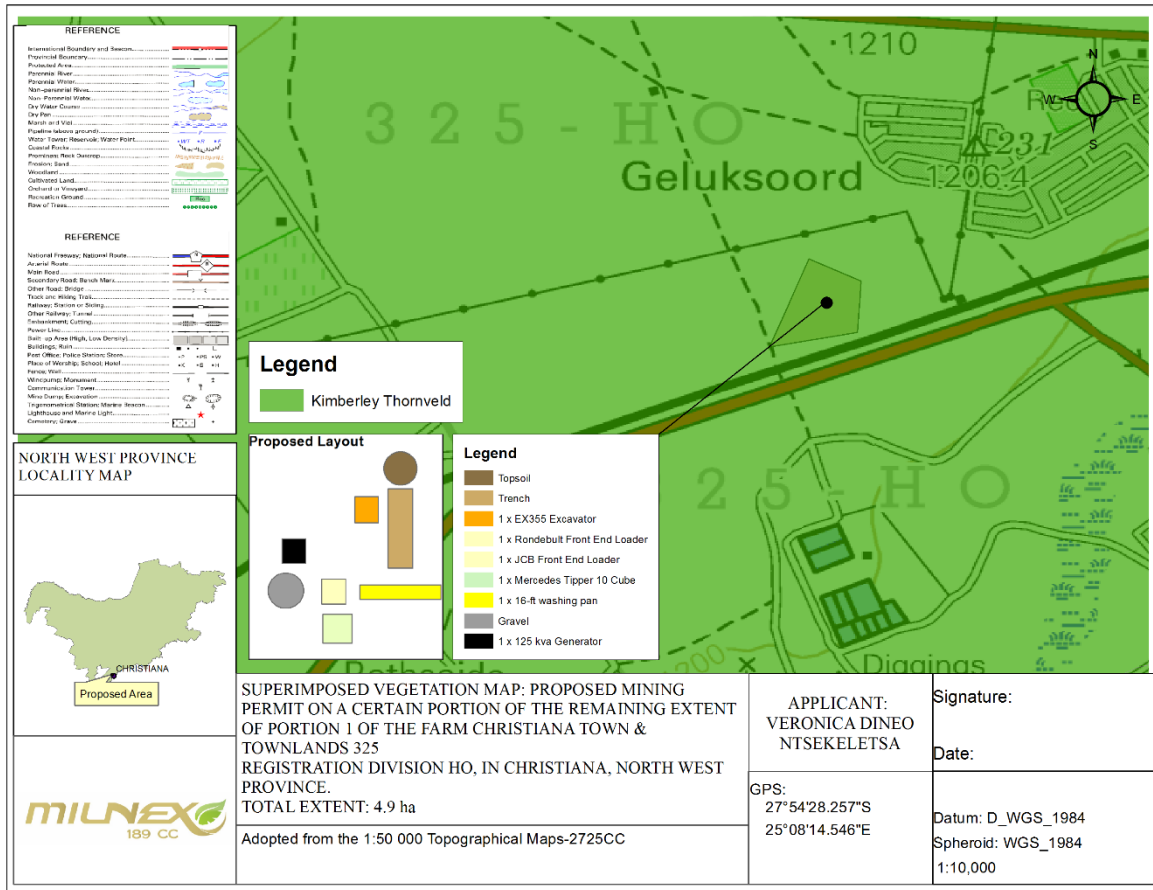
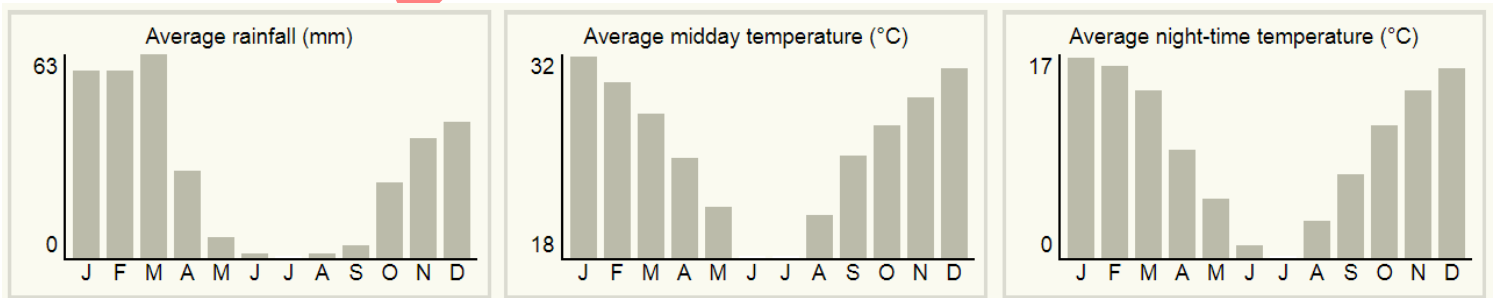


Figure 7: Vegetation Ecology

See Appendix 7 for the Ecological desktop study done.

**Climate and water availability**

Christiana normally receives about 320mm of rain per year, with most rainfall occurring mainly during summer. The chart below (lower left) shows the average rainfall values for Christiana per month. It receives the lowest rainfall (0mm) in July and the highest (63mm) in March. The monthly distribution of average daily maximum temperatures (centre chart below) shows that the average midday temperatures for Christiana range from 18°C in June to 31.8°C in January. The region is the coldest during July when the mercury drops to 0°C on average during the night. Consult the chart below (lower right) for an indication of the monthly variation of average minimum daily temperatures. (SAExplorer, 2016).



- Terrain, topography and drainage

Plain often slightly irregular with well-developed tree layer with *Acacia erioloba*, *A. tortilis*, *A. karroo* and *Boscia*

*albitrunca* and well-developed shrub layer with occasional dense stands of *Tarchonanthus camphoratus* and *A. mellifera*. Grass layer open with much uncovered soil.

- **Soils**

According to Mucina and Rutherford (2006) the site is underlain by Andestic lavas of the Allanridge Formation in the north and west and fine-grained sediments of the Karoo Supergroup in the south and east. Deep (0.6 – 1.2m) sandy to loamy soils of the Hutton soil form (Ae and Ah land types) on slightly undulating sandy plains.

**Protected Areas**

According to the data for protected areas, the proposed area does not fall within a Formally Protected Area, nor Threatened Ecosystem.

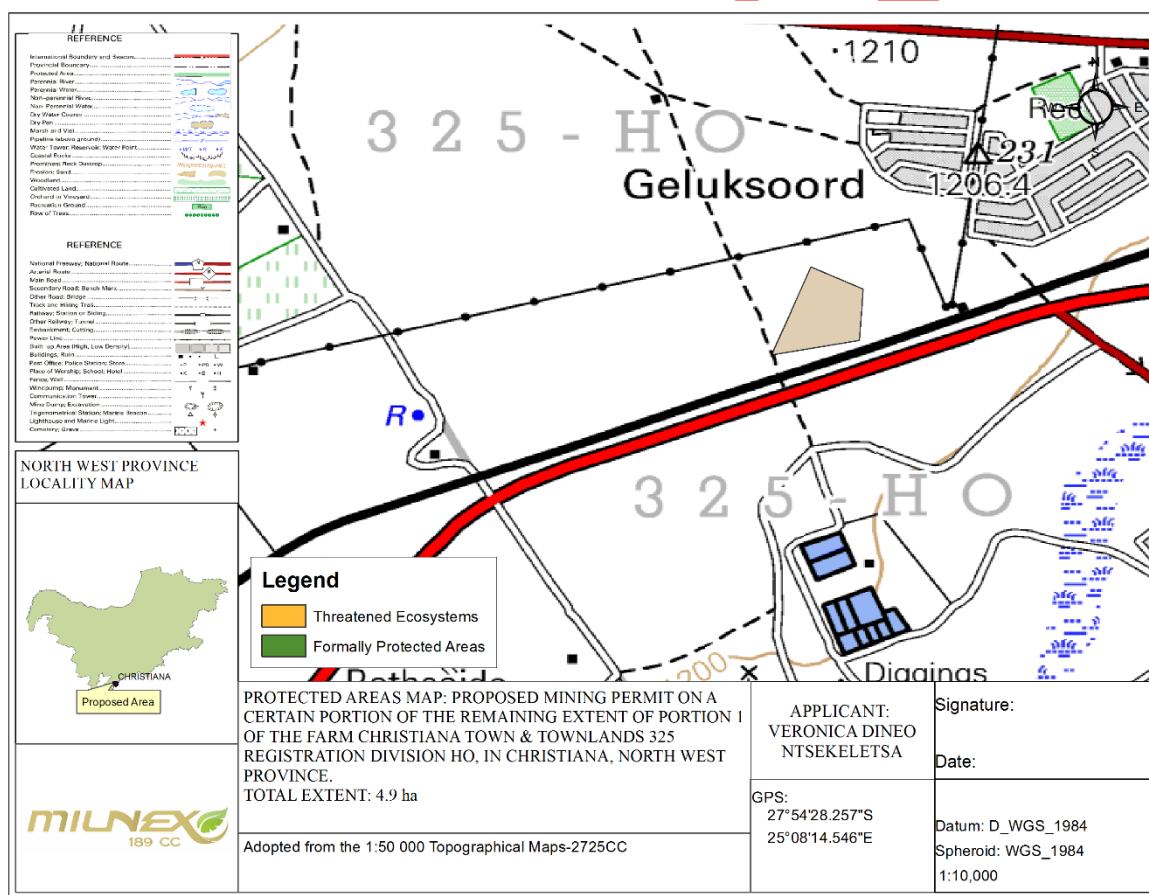


Figure 8: Protected Areas Map

**Critical Biodiversity Area**

According to B-GIS “Critical biodiversity areas (CBAs) are areas of the landscape that need to be maintained in a natural or near-natural state in order to ensure the continued existence and functioning of species and ecosystems and the delivery of ecosystem services”, therefore the purpose of CBA’s is simply to indicate spatially the location of critical or important areas for biodiversity in the landscape.

According to the data for Critical Biodiversity Areas the proposed area does not fall within any Critical Biodiversity Area.





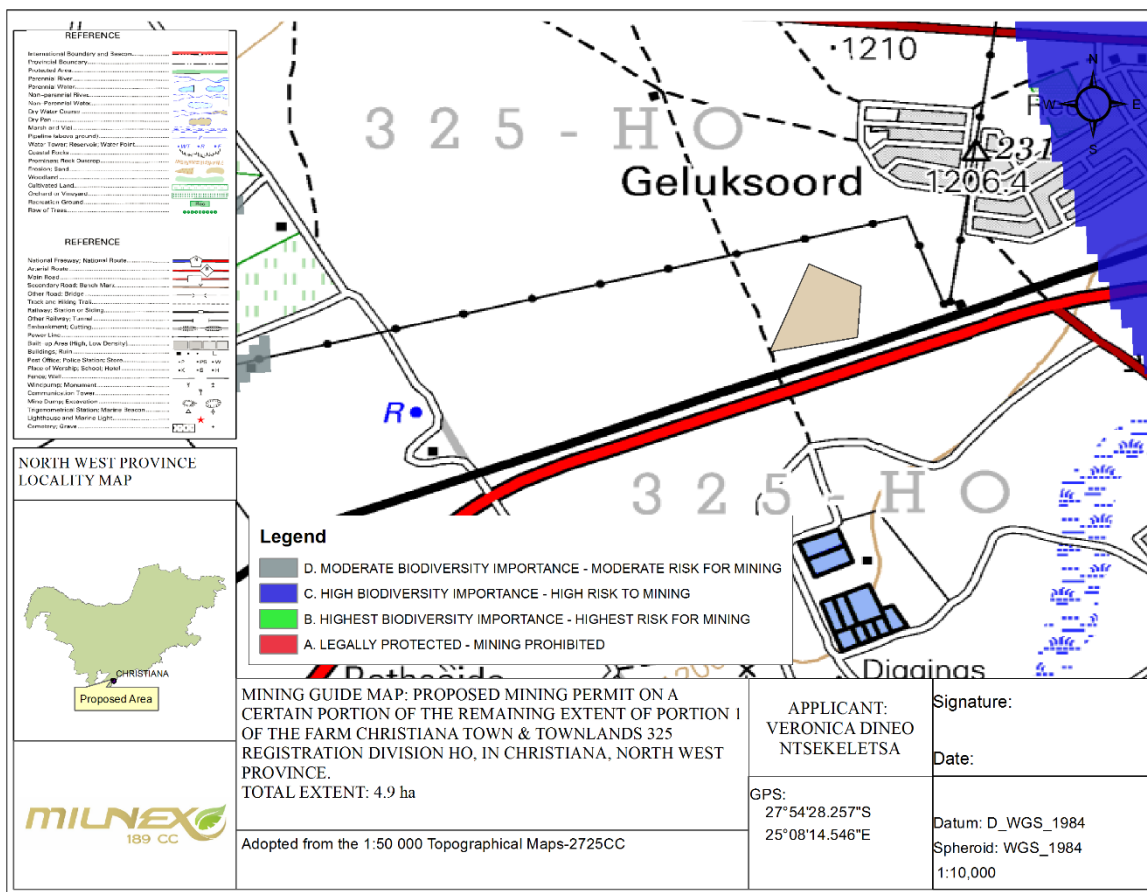


Figure 10: Sensitive area for mine

### Wetland Areas

Wetland is defined as land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil (from the South African National Water Act; Act No. 36 of 1998).

The maps below depict all wetland areas on the proposed area. The proposed area consists of no wetland, however the wetland vegetation type falls within the Eastern Kalahari Bushveld Group 3.

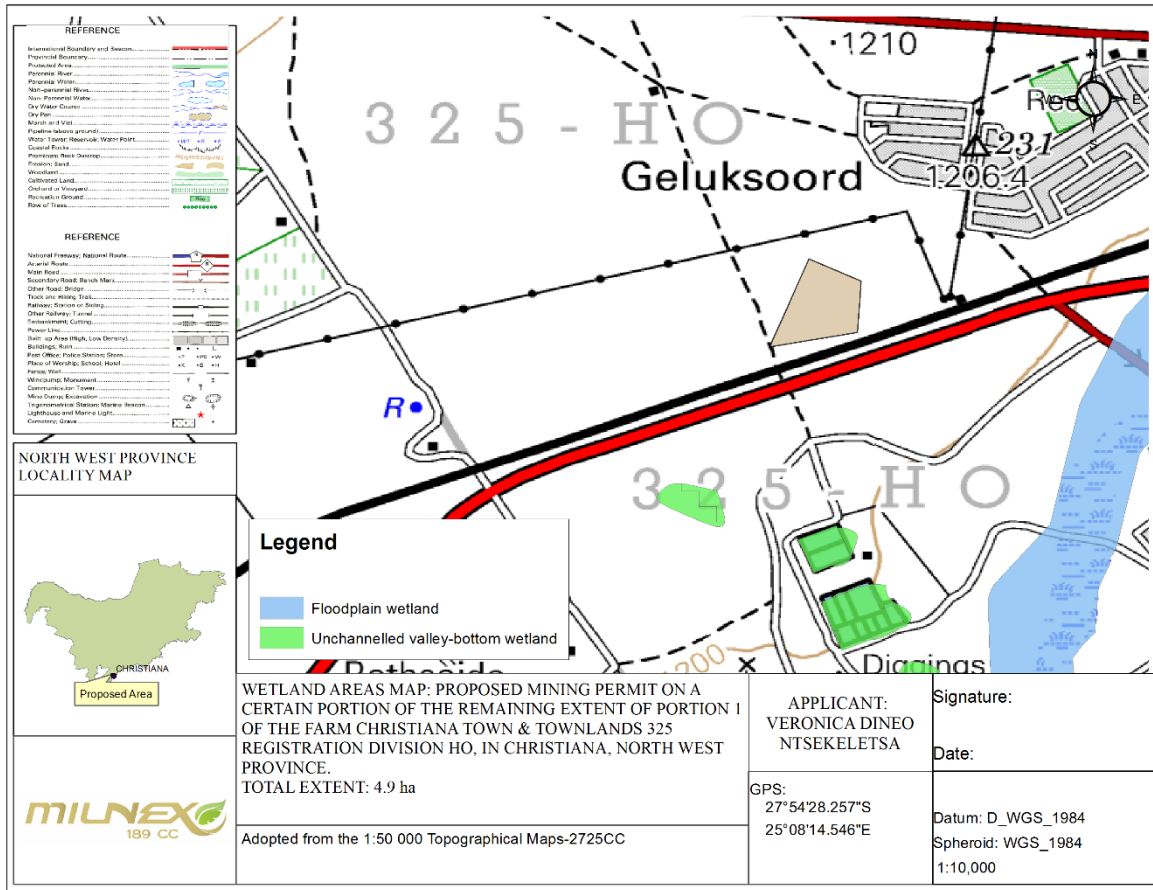


Figure 11: Wetland types present on site

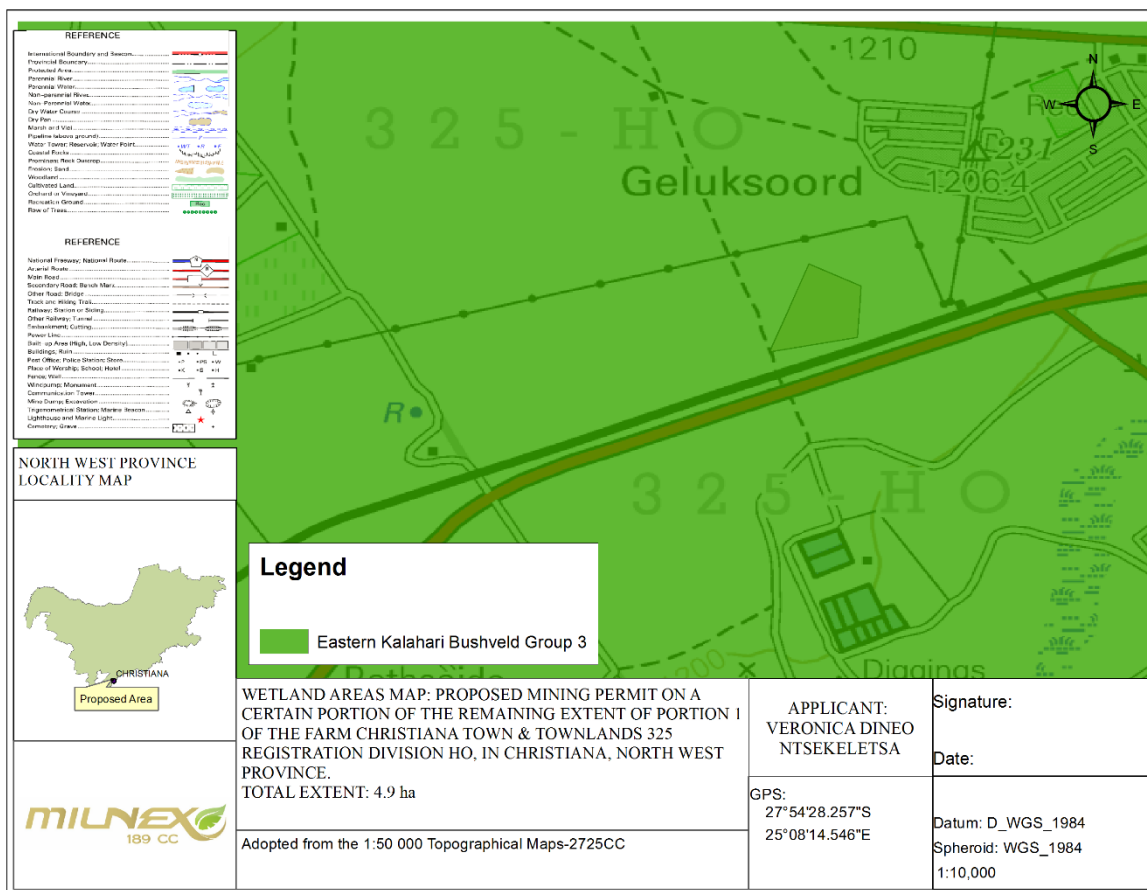


Figure 12: Wetland types present on site

**River Ecosystem Status**

The status of the river in question is Largely modified (Class D) in this area. The river does not flow through the proposed area. The figure below depicts the river ecosystem status.

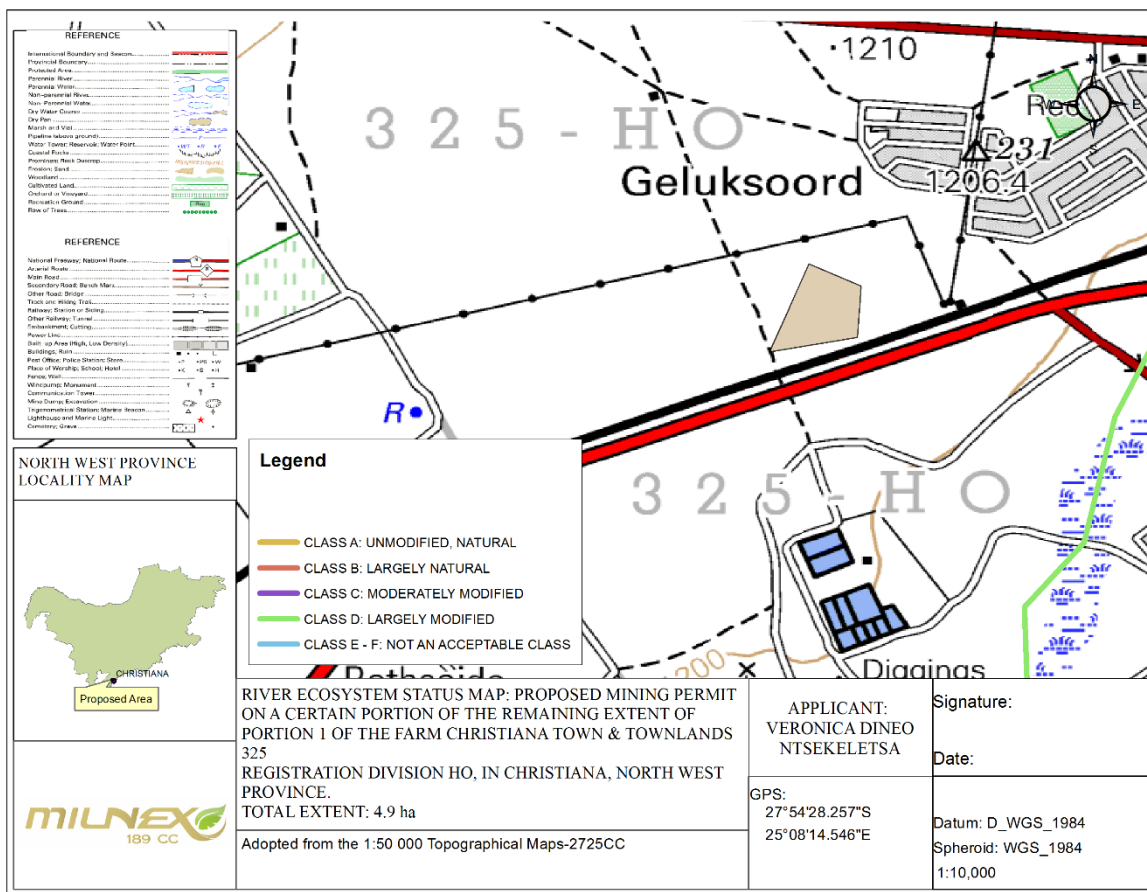


Figure 12: River Ecosystem Status

### Description of the socio-economic environment

- Socio-economic conditions**

Lekwa-Teemane Local Municipality (NW396) is approximately 3 681 km<sup>2</sup> in extent. This land mass makes up 7, 75% of the total area of the Dr Ruth Segomotsi Mompati District Municipality area. The administrative centre of the municipality is in the rural area of Christiana. The other offices are located in Bloemhof.

Statistics South Africa, records 56 025 as the total population of Lekwa-Teemane Local Municipality. This is 9.94% of the total population Dr Ruth Segomotsi Mompati District Municipality of about 500,365 people. However, the Community Survey 2007 indicated a total population figure of 32 809 for Lekwa-Teemane Local Municipality. To date it is anticipated that this figure has increased due to various factors like the attraction of job opportunities in agriculture and hunting in the area.

With a total of 14 930 households, Lekwa-Teemane Local Municipality has the smallest population in the Dr Ruth Segomotsi Mompati District. The average population density for Lekwa-Teemane Local Municipality has increased from 13, 5 people per km<sup>2</sup> in 2001 to 14, 5 people per km<sup>2</sup> in 2011. The municipality is divided into eight administration wards and has a total of 16 councillors (both ward councillors and PR councillors)

The current employment situation is analysed by considering employment in the various sectors, presenting figures of employment and unemployment. The GDP figures directly point to the sectors which employ the greatest numbers of people. These sectors are agriculture and hunting, food and beverages, transport, finance and insurance education and health and social services.

According to Statistics South Africa's census 2011 the LTLM unemployment rate stands at 34%. This percentage is high and the municipality needs to increase job opportunities within Lekwa Teemane. Programmes such as the EPWP and CWP need to be increased. This huge difference is explained by the high number of men who are employed in agriculture and hunting. The high number of coloureds unemployed is a challenge as this could lead to social problems like crime, drug abuse and further depress the upliftment of the racial group in LTLMA.

The major economic activities in the Municipality are Retail, Alluvial diamonds, Tourism and Agriculture. Growth occurred in isolated instances in the agricultural, mining, provision of electricity, trade and services sectors. The manufacturing, construction, finance and real estate sectors showed a general decline.

• Cultural and heritage aspects

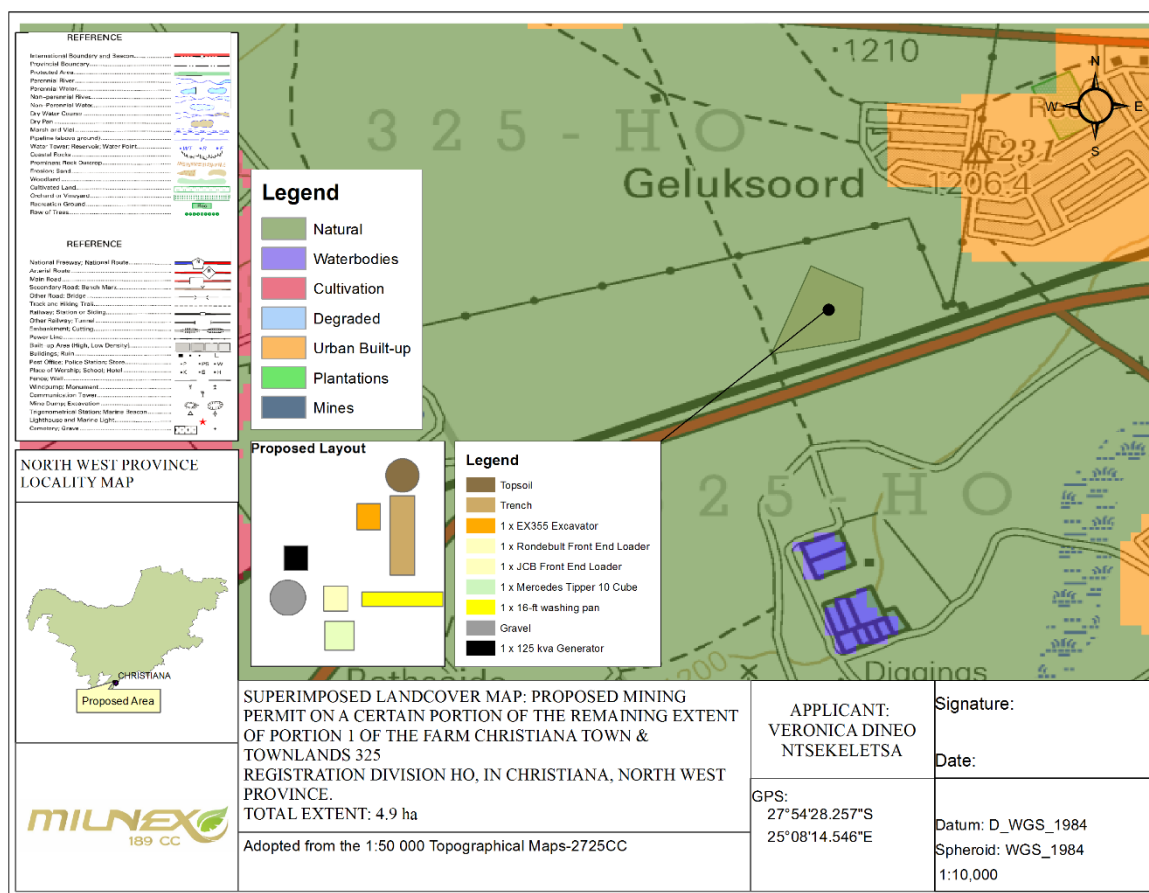
No cultural or heritage resources were identified on site.

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 prospecting 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.

**Description of the current land uses.**

The site survey revealed that land uses on and in the immediate vicinity of the proposed development are essentially comprised of natural areas - refer to **Appendix 5** for photographs of the development area.

Below is the land cover of the farm



**Figure 13:** Superimposed land cover

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

The area proposed for the mining activity exclusively consists of natural cover and is vacant municipality land.

**(d) Environmental and current land use map.**

(Show all environmental, and current land use features)

Refer to Locality Map attached as **Appendix 3**.

**iii. Impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts**

(Provide a list of the potential impacts identified of the activities described in the initial site layout that will be undertaken, as informed by both the typical known impacts of such activities, and as informed by the consultations with affected parties together with the significance, probability, and duration of the impacts. Please indicate the extent to which they can be reversed, the extent to which they may cause irreplaceable loss of resources, and can be avoided, managed or mitigated).

**Significance of potential impacts**

The following sections present the outcome of the significance rating exercise. The results suggest that only 2 of the key issues identified as part of the basic assessment process had a negative high environmental significance. Instead the overall score indicates a low environmental significance score.

**CONSTRUCTION PHASE**

**Direct impacts:** During the construction phase minor negative impacts are foreseen over the short term. The latter refers to a period of months. The installation of services may result in the loss or fragmentation of indigenous natural fauna and flora, loss or fragmentation of habitats, soil erosion, hydrology, and temporary noise disturbance, generation of waste, visual intrusions, increase in construction vehicle traffic, risk to safety, livestock and farm infrastructure, and increased risk of veld fires. It is obvious that the construction phase will also have a direct positive impact through the provision of employment opportunities for its duration and technical advice for local farmers and municipalities. The abovementioned impacts are discussed in more detail below:

- **Loss or fragmentation of indigenous natural fauna and flora –**

In terms of vegetation type the site falls within the Kimberley Thornveld vegetation type (Mucina and Rutherford, 2006). The Kimberley Thornveld vegetation type is described by Mucina and Rutherford (2006) as ‘least threatened’. Kimberley Thornveld vegetation covers areas of the North-West, Free State and Northern Cape Provinces. The region is characterised by plains often slightly irregular with well-developed tree layer with *Acacia erioloba*, *A. tortilis*, *A. karroo* and *Boscia albitrunca* and well-developed shrub layer with occasional dense stands of *Tarchonanthus camphoratus* and *A. mellifera*. A few scattered *Acacia Erioloba* trees are present on site.

<b>Loss or fragmentation of indigenous natural fauna and flora</b>	<b>Pre-mitigation impact rating</b>	<b>Post mitigation impact rating</b>
Status (positive or negative)	Negative	Negative
Extent	Site (1)	Site (1)

Probability	Definite (4)	Definite (4)
Duration	Medium term (2)	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	Low cumulative impacts (2), since the pitting and trenching will be only 4.9 Ha in extent.	
<b>Significance</b>	<b>Negative low (28)</b>	<b>Negative low (13)</b>
Can impacts be mitigated?	<p>If the development is approved, contractors must ensure that no mammalian species are disturbed, trapped, hunted or killed during the construction phase. If the development is approved, every effort should be made to confine the footprint to the blocks allocated for the development and have the least possible edge effects on the surrounding area. The EMPr also provides numerous mitigation measures – refer to section (f) of the EMPr.</p> <p>The potential impacts associated with damage to and loss of farmland should be effectively mitigated. The aspects that should be covered include:</p> <ul style="list-style-type: none"> <li>• The site should be fenced off prior to commencement of construction activities;</li> <li>• The footprint associated with the construction related activities (access roads, construction platforms, workshop etc.) should be confined to the fenced off area and minimised where possible;</li> <li>• An Environmental Control Officer (ECO) should be appointed to monitor the establishment phase of the construction phase;</li> <li>• All areas disturbed by construction related activities, such as access roads on the site, construction platforms, workshop area etc., should be rehabilitated at the end of the construction phase;</li> <li>• The implementation of a rehabilitation programme should be included in the terms of reference for the contractor/s appointed. Specifications for the rehabilitation are provided throughout the EMPr – section (f) of the EMPr.</li> <li>• The implementation of the Rehabilitation Programme should be monitored by the ECO.</li> </ul>	

- Loss or fragmentation of habitats –The proposed 4.9ha mining area does not fall within any Critical Biodiversity Area. The proposed site is therefore considered to have limited environmental sensitivity as a result.

<b>Loss or fragmentation of habitats</b>	<b>Pre-mitigation impact rating</b>	<b>Post mitigation impact rating</b>
Status (positive or negative)	Negative	Negative
Extent	Site (1)	Site (1)
Probability	Definite (4)	Definite (4)
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 impacts (2), since the pitting and trenching will be only 4.9ha in extent.	
<b>Significance</b>	<b>Negative low (26)</b>	<b>Negative low (13)</b>

Can impacts be mitigated?	Exotic and invasive plant species should not be allowed to establish, if the development is approved. Where exotic and invasive plant species are found at the site continuous eradication should take place. If the development is approved, every effort should be made to confine the footprint to the blocks allocated for development – section (f) of the EMP also provides numerous mitigation measures related to fauna and flora.
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- **Loss of topsoil** – Topsoil may be lost due to poor topsoil management (burial, erosion, etc.) during construction related soil profile disturbance (levelling, excavations, disposal of spoils from excavations etc.) The effect will be the loss of soil fertility on disturbed areas after rehabilitation.

Loss of topsoil	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Geographical extent	Site (1)	Site (1)
Probability	Possible (2)	Unlikely (1)
Duration	Medium term (2)	Medium term (2)
Magnitude	Medium (2)	Medium (2)
Reversibility	Partly reversible (2)	Partly reversible (2)
Irreplaceable loss of resources	Marginal (2)	Marginal (2)
Cumulative impact	Low cumulative impact (2).	
<b>Significance</b>	<b>Negative low (22)</b>	<b>Negative low (20)</b>
Can impacts be mitigated?	<p>The following mitigation or management measures are provided:</p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• Topsoil stockpiles must be conserved against losses through erosion by establishing vegetation cover on them.</li> <li>• Dispose of all subsurface spoils from excavations where they will not impact on undisturbed land.</li> <li>• During rehabilitation, the stockpiled topsoil must be evenly spread over the entire disturbed surface.</li> <li>• Erosion must be controlled where necessary on top soiled areas.</li> </ul> <p>Establish an effective record keeping system for each area where soil is disturbed for constructional purposes. These records should be included in environmental performance reports, and should include all the records below.</p> <ul style="list-style-type: none"> <li>• Record the GPS coordinates of each area.</li> <li>• Record the date of topsoil stripping.</li> <li>• Record the GPS coordinates of where the topsoil is stockpiled.</li> <li>• Record the date of cessation of constructional (or operational) activities at the particular site.</li> <li>• Photograph the area on cessation of constructional activities.</li> <li>• Record date and depth of re-spreading of topsoil.</li> </ul>	



	<ul style="list-style-type: none"> <li>Photograph the area on completion of rehabilitation and on an annual basis thereafter to show vegetation establishment and evaluate progress of restoration over time.</li> </ul> <p>Section (f) of the EMP also provide mitigation measures related to topsoil management.</p>
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- Soil erosion** – Soil erosion due to alteration of the land surface run-off characteristics. Alteration of run-off characteristics may be caused by construction related land surface disturbance, vegetation removal and the establishment of roads. Erosion will cause loss and deterioration of soil resources. According to the land capability map the proposed 4.9ha falls within Class 5 which has little or no erosion hazard

Soil erosion	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Geographical extent	Site (1)	Site (1)
Probability	Possible (2)	Unlikely (1)
Duration	Medium term (2)	Medium term (2)
Magnitude	Medium (2)	Medium (2)
Reversibility	Partly reversible (2)	Partly reversible (2)
Irreplaceable loss of resources	Marginal (2)	Marginal (2)
Cumulative impact	Negligible cumulative impact (1).	
<b>Significance</b>	<b>Negative low (20)</b>	<b>Negative low (18)</b>
Can impacts be mitigated?	<p>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.</p> <p>Include periodical site inspection in environmental performance reporting that inspects the effectiveness of the run-off control system and specifically records the occurrence any erosion on site or downstream – refer to section (f) of the EMP.</p>	

- Temporary noise disturbance** - Construction activities will result in the generation of noise over a period of months. Sources of noise are likely to include vehicles, the use of machinery such as back actors and people working on the site. The noise impact is unlikely to be significant; but construction activities should be limited to normal working days and hours (7:00 – 17:00).

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	Short term (1)	Short term (1)
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	The impact would result in negligible to no cumulative effects (1).	
<b>Significance</b>	<b>Negative medium (30)</b>	<b>Negative low (18)</b>

Can impacts be mitigated?	Yes, management actions related to noise pollution are included in section (f) of the EMPr.
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- Generation of waste - general waste, construction waste, sewage and grey water - The workers on site are likely to generate general waste such as food wastes, packaging, bottles, etc. Construction waste is likely to consist of packaging, scrap metals, waste cement, 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/VIP 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	Short term (1)	Short term (1)
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 if services become unstable or unavailable, which in turn would negatively impact on the local community.	
<b>Significance</b>	<b>Negative low (13)</b>	<b>Negative low (13)</b>
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 –In terms of the National Heritage Resource Act no 25 of 1999. Heritage resources including archaeological and paleontological sites over 100 years old, graves older than 60 years, structure older than 60 years are protected. They may 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 will be contacted immediately and work will stop.

Impacts on heritage objects	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	Short term (1)	Short term (1)
Magnitude	Medium (2)	Low (1)
Reversibility	Irreversible (4)	Irreversible (4)
Irreplaceable loss of resources	Marginal loss of resource (2)	Marginal loss of resource (2)
Cumulative impact	Low cumulative impact (2). Should these impacts occur, there may be a cumulative impact on the preservation of heritage objects in the area.	
<b>Significance</b>	<b>Negative low (24)</b>	<b>Negative low (12)</b>
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. Also refer to section (f) of the EMPr.	

**Indirect impacts:** The nuisance aspects generally associated with the installation of infrastructure will also be applicable to this development, which relates primarily to the increase in construction vehicle traffic, impact of construction workers on local communities, the influx of job seekers to the area, risk to safety, livestock and farm infrastructure, and increased risk of veld fires.

- Increase in construction 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. Access will be obtained from gravel road off the R506 between Christiana and Jan Kempdorp. While the volume of traffic along this road is medium, the movement of heavy vehicles along this road is likely to damage the road surface and impact on other road users. The contractor should be required to ensure that damage to the road is repaired periodically.

Increase in construction vehicle traffic	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Local (2)	Local (2)
Probability	Probable (3)	Probable (3)
Duration	Short term (1)	Short 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	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.	
<b>Significance</b>	<b>Negative low (22)</b>	<b>Negative low (11)</b>
Can impacts be mitigated?	<p>The potential impacts associated with heavy vehicles can be effectively mitigated. The mitigation measures include:</p> <ul style="list-style-type: none"> <li>• The contractor must ensure that damage caused by construction related traffic to the gravel roads is repaired before the completion of the construction phase. The costs associated with the repair must be borne by the contractor;</li> <li>• 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;</li> <li>• 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.</li> </ul> <p>Also refer section (f) of the EMP. For mitigation measures related to construction traffic.</p>	

- Impact of construction workers on local communities - 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.

Impacts of construction workers on local communities	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Local (1)	Local (1)
Probability	Probable (3)	Probable (3)
Duration	Short term for community as a whole (1)	Short term for community as a whole (1)
Magnitude	Low for the community as a whole (1)	Low for the community as a whole (1)
Reversibility	Completely reversible (1)	Completely reversible (1)
Irreplaceable loss of resources	Marginal loss of resource (2)	Marginal loss of resource (2)
Cumulative impact	Medium cumulative effects (3)	
<b>Significance</b>	<b>Low for the community as a whole (11)</b>	<b>Low for the community as a whole (11)</b>
Can impacts be mitigated?	<p>Yes, the potential risks associated with construction workers can be effectively mitigated. The detailed mitigation measures are outlined in the Environmental Management Programme (EMPr) for the Construction Phase. Aspects that should be covered include:</p> <ul style="list-style-type: none"> <li>• Where possible Veronica Dineo Ntsekeletsa should make it a requirement for contractors to implement a 'locals first' policy for construction jobs, specifically for semi and low-skilled job categories;</li> <li>• Veronica Dineo Ntsekeletsa and the contractor(s) should develop a code of conduct for the construction phase. The code should identify which types of behaviour and activities are not acceptable. Construction workers in breach of the code should be dismissed. All dismissals must comply with the South African labour legislation;</li> <li>• Veronica Dineo Ntsekeletsa and the contractor should implement an HIV/AIDS awareness programme for all construction workers at the outset of the construction phase;</li> <li>• The construction area should be fenced off before construction commences and no workers should be permitted to leave the fenced off area;</li> <li>• The contractor should provide transport to and from the site on a daily basis for low and semi-skilled construction workers. This will enable the contractor to effectively manage and monitor the movement of construction workers on and off the site;</li> <li>• Where necessary, the contractors should make the necessary arrangements to enable low and semi-skilled workers from outside the area to return home over weekends and/ or on a regular basis. This would reduce the risk posed to local family structures and social networks;</li> <li>• It is recommended that no construction workers, with the exception of security personnel, should be permitted to stay over-night on the site.</li> </ul>	

- Risk to safety, livestock and farm infrastructure - The presence on and movement of construction workers on and off the site poses a potential safety threat to local farmer's and farm workers in the vicinity of the site threat. In addition, farm infrastructure, such as fences and gates, may be damaged and stock losses may also result from gates being

left open and/or fences being damaged or stock theft linked either directly or indirectly to the presence of farm workers on the site.

Risk to safety, livestock and farm infrastructure	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Local (2)	Local (2)
Probability	Unlikely (1)	Unlikely (1)
Duration	Short term (1)	Short term (1)
Magnitude	Medium (2)	Low (1)
Reversibility	Completely reversible (1)	Completely reversible (1)
Irreplaceable loss of resources	Marginal loss of resource (2)	No loss of resource (1)
Cumulative impact	Negligible cumulative effects (1), provided losses are compensated for.	
<b>Significance</b>	<b>Negative low (16)</b>	<b>Negative low (7)</b>
Can impacts be mitigated?	<p>Key mitigation measures include:</p> <ul style="list-style-type: none"> <li>• Veronica Dineo Ntsekeletsa should enter into an agreement with the local farmers in the area whereby damages to farm property etc. during the construction phase will be compensated for. The agreement should be signed before the construction phase commences;</li> <li>• The construction area should be fenced off prior to the commencement of the construction phase. The movement of construction workers on the site should be confined to the fenced off area;</li> <li>• Contractors appointed by Veronica Dineo Ntsekeletsa should provide daily transport for low and semi-skilled workers to and from the site. This would reduce the potential risk of trespassing on the remainder of the farm and adjacent properties;</li> <li>• Veronica Dineo Ntsekeletsa should hold contractors liable for compensating farmers in full for any stock losses and/or damage to farm infrastructure that can be linked to construction workers. This should be contained in the Code of Conduct to be signed between the proponent, the contractors and neighbouring landowners. The agreement should also cover losses and costs associated with fires caused by construction workers or construction related activities (see below);</li> <li>• The Environmental Management Programme (EMPr) should outline procedures for managing and storing waste on site, specifically plastic waste that poses a threat to livestock if ingested;</li> <li>• Contractors appointed by Veronica Dineo Ntsekeletsa must ensure that all workers are informed at the outset of the construction phase of the conditions contained on the Code of Conduct, specifically consequences of stock theft and trespassing on adjacent farms.</li> <li>• Contractors appointed by Veronica Dineo Ntsekeletsa must ensure that construction workers who are found guilty of trespassing, stealing livestock and/or damaging farm infrastructure are dismissed and charged. This should be contained in the Code of Conduct. All dismissals must be in accordance with South African labour legislation;</li> </ul>	

	<ul style="list-style-type: none"> <li>The housing of construction workers on the site should be strictly limited to security personnel.</li> </ul>
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- Increased risk of veld fires** - 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 community in the area. In the process, farm 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)	Probable (3)
Duration	Medium term (2)	Medium term (2)
Magnitude	High (3)	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	Negligible cumulative effects (1), provided losses are compensated for.	
<b>Significance</b>	<b>Negative medium (33)</b>	<b>Negative low (10)</b>
Can impacts be mitigated?	<p>The mitigation measures include:</p> <ul style="list-style-type: none"> <li>A fire-break should be constructed around the perimeter of the site prior to the commencement of the construction phase;</li> <li>Contractor should ensure that open fires on the site for cooking or heating are not allowed except in designated areas;</li> <li>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;</li> <li>Contractor to provide adequate firefighting equipment on-site, including a fire fighting vehicle;</li> <li>Contractor to provide fire-fighting training to selected construction staff;</li> <li>No construction staff, with the exception of security staff, to be accommodated on site over night;</li> <li>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.</li> </ul>	

## OPERATIONAL PHASE

**Direct impacts:** During the operational phase the study area will serve as an electricity generation facility and the impacts are generally associated with soil erosion, change in land use, impacts associated with the surrounding land uses, increase in storm water runoff, increased consumption of water, visual intrusion, the generation of general waste, leakage of hazardous materials, and the change in the sense of place. The operational phase will also have a direct positive impact through the provision of permanent employment opportunities, the generation of additional electricity, the establishment of a community trust, financial implication to tourism in the area, and the development of infrastructure for the generation of clean, renewable energy. The abovementioned impacts are discussed in more detail below:

- Soil erosion – The largest risk factor for soil erosion will be during the operational phase when the mining activity ensues and soil is left bare until rehabilitation is initiated. Erosion will be localized within the site boundary but will have a permanent effect that would stretch into the operational phase of the project. 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/Regional (2)	Site (1)
Probability	Definite (4)	Unlikely (1)
Duration	Long term (3)	Long term (3)
Magnitude	High (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 impact (3). Should these impacts occur, there will be a cumulative impact on the air and water resources in the study area in terms of pollution.	
<b>Significance</b>	<b>Negative high (51)</b>	<b>Negative Low (24)</b>
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 area as it becomes necessary and to implement concurrent rehabilitation.  Also refer to section (f) of the EMP.	

- Change in land-use – The use of the area for the construction and operation of the Diamond Alluvial and Diamonds General mine will result in the area being used.

Change in land use	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Site (1)	Site (1)
Probability	Definite (4)	Definite (4)
Duration	medium term (2)	medium term (2)
Magnitude	Low (1)	Low (1)
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 impacts (2).	
<b>Significance</b>	<b>Negative low (12)</b>	<b>Negative low (12)</b>

Can impacts be mitigated?	The proponent should establish a Rehabilitation Fund to be used to rehabilitate the area once the proposed facility has been decommissioned. The fund should be funded by revenue generated during the operational phase of the project. The motivation for the establishment of a Rehabilitation Fund is based on the experience in the mining sector where many mines on closure have not set aside sufficient funds for closure and decommissioning.  Also refer to section (f) of the EMP.
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- Generation of alternative land use income – Income generated through the diamond alluvial & diamond general mine will provide the farming enterprise with increased cash flow and rural livelihood, and thereby improve the financial sustainability of farming on site.

Generation of alternative land use income	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Positive	Positive
Geographical extent	Site (1)	Site (1)
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).	
<b>Significance</b>	<b>Positive Low (24)</b>	<b>Positive Low (24)</b>
Can impacts be mitigated?	No mitigation required.	

- 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, especially where vegetation will be cleared. Not all the vegetation should be removed at once. Vegetation corridors should be maintained within the subject area.

Increase in storm water runoff	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Local (2)	Local (2)
Probability	Probable (3)	Unlikely (1)
Duration	Long term (3)	Long term (3)
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	Medium cumulative impact (3) - Should these impacts occur, there will be cumulative impacts on the wider area.	
<b>Significance</b>	<b>Negative medium (30)</b>	<b>Negative low (13)</b>
Can impacts be mitigated?	Yes. It is therefore important that all management actions and mitigation measures included in section (f) of the EMP. are implemented to ensure that these impacts do not occur	

- Increased consumption of water - Approximately 17 000 liters of water per hour will be required for the washing of the gravel in the rotary pan.

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	Medium (2)	Medium (2)
Reversibility	Irreversible (4)	Irreversible (4)
Irreplaceable loss of resources	Marginal loss of resources (2)	Marginal loss of resources (2)
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.	
<b>Significance</b>	<b>Negative medium (40)</b>	<b>Negative medium (40)</b>
Can impacts be mitigated?	Yes, management actions and mitigation measures related to the use of water are included in section (f) of the EMP.	

- Generation of waste – Approximately 15 Workers will be present on site from 7:00 – 17:00, 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.

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.	
<b>Significance</b>	<b>Negative low (15)</b>	<b>Negative low (15)</b>
Can impacts be mitigated?	Yes, management actions related to waste management are included in section (f) of the EMP.	

- Leakage of hazardous materials - The proposed mining activity will make use of machinery that use fuel and oil. Leakage of these oils and fuel can contaminate water supplies and must be prevented by constructing oil and diesel permeable bunds to ensure that any spills are suitably attenuated and not released into the environment.

Leakage of hazardous materials	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Local (2)	Local (2)
Probability	Possible (2)	Unlikely (1)
Duration	Long term (3)	Long term (3)
Magnitude	High (3)	Medium (2)
Reversibility	Partly reversible (2)	Partly reversible (2)
Irreplaceable loss of resources	Marginal loss of resource (2)	Marginal loss of resource (2)
Cumulative impact	The impact would result in negligible to no cumulative effects (1)	
<b>Significance</b>	<b>Negative medium (36)</b>	<b>Negative low (22)</b>
Can impacts be mitigated?	Yes. It is therefore important that all management actions and mitigation measures included in the section (f) of EMP are implemented to ensure that these impacts do not occur.	

- **Noise disturbance** - Mining activities will result in the generation of noise over a period of 3-5 years. Sources of noise are likely to include vehicles, the use of machinery such as backactors, rotary pans and people working on the site, as well as occasional blasting. The noise impact is unlikely to be significant as the closest homestead is more than 1km from the site; but mining activities should be limited to normal working days and some Saturdays and hours (7:00 – 17:00).

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 (2)	Medium term (2)
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	The impact would result in negligible to no cumulative effects (1).	
<b>Significance</b>	<b>Negative low (22)</b>	<b>Negative low (10)</b>
Can impacts be mitigated?	Yes, management actions related to noise pollution are included in section (f) of the EMP.	

**Indirect impacts:** The operational phase will have an indirect negative impact through the change in the sense of place and an indirect positive impact through the provision of additional electrical infrastructure.

- **Potential impact on tourism** – The tourism sector is regarded as an important economic sector in the NWP and LTLMA. 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 diamond alluvial on the areas sense of place with mitigation is likely to be low. In addition, the site will not be visible from the R34. The impact of the proposed mine on the tourism potential of the area and the LTLMA and NWP is therefore 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	Low (1)	Low (1)
Reversibility	Completely reversible (1)	Completely reversible (1)
Irreplaceable loss of resources	N/a	N/a
Cumulative impact	N/a	
<b>Significance</b>	<b>Negative low (6)</b>	<b>Negative low (6)</b>
Can impacts be mitigated?	No mitigation required	

### **DECOMMISSIONING PHASE (MINE CLOSURE AND REHABILITATION)**

**Direct impacts:** Typically, the major social impacts associated with the decommissioning phase are linked to the loss of jobs and associated income. This has implications for the households who are directly affected, the communities within which they live. If infrastructures are removed after a 3/5 year period, the site will be returned to its natural state.

- **Rehabilitation of the physical environment** – The physical environment will benefit from the closure of the mine since the site will be restored to its natural state.

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	Probable (3)	Definite (4)
Duration	Long term (3)	Long term (3)
Magnitude	Low (1)	Medium (2)
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)	
<b>Significance</b>	<b>Negative low (8)</b>	<b>Negative low (18)</b>
Can impacts be mitigated?	No mitigation measures required.	

- Loss of employment - Given the relatively large number of people employed during the operational phase, the decommissioning of the facility has the potential to have a negative social impact on the local community.

Loss of employment	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	Permanent (4)	Permanent (4)
Magnitude	Very high (4)	Very high (4)
Reversibility	Irreversible (4)	Irreversible (4)
Irreplaceable loss of resources	N/A	N/A
Cumulative impact	The impact would result in medium cumulative effects (3)	
<b>Significance</b>	<b>Negative high (68)</b>	<b>Negative high (68)</b>
Can impacts be mitigated?	The following mitigation measures are recommended: <ul style="list-style-type: none"> <li>• All structures and infrastructure associated with the proposed facility should be dismantled and transported off-site on decommissioning;</li> <li>• Veronica Dineo Ntsekeletsa should establish an Environmental Rehabilitation Trust Fund to cover the costs of decommissioning and rehabilitation of disturbed areas.</li> </ul>	

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

- iv. **Methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks;** (Describe how the significance, probability, and duration of the aforesaid identified impacts that were identified through the consultation process was determined in order to decide the extent to which the initial site layout needs revision).

**Method of environmental assessment**

The environmental assessment aims to identify the various possible environmental impacts that could result from the proposed development. Different impacts need to be evaluated in terms of their significance and in doing so highlight the 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 must take account of the nature, scale and duration of impacts on the environment whether such impacts are positive or negative. Each impact is also assessed according to the following project phases:

- Construction
- Operation
- Decommissioning

Where necessary, the proposal for mitigation or optimisation 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**

<b>NATURE</b>		
Include a brief description of the impact of environmental parameter being assessed in the context of the project. This criterion includes a brief written statement of the environmental aspect being impacted upon by a particular action or activity.		
<b>GEOGRAPHICAL EXTENT</b>		
This is defined as the area over which the impact will be experienced.		
1	Site	The impact will only affect the site.
2	Local/district	Will affect the local area or district.
3	Province/region	Will affect the entire province or region.
4	International and National	Will affect the entire country.
<b>PROBABILITY</b>		
This describes the chance of occurrence of an impact.		
1	Unlikely	The 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).

<b>DURATION</b>		
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.
<b>INTENSITY/ MAGNITUDE</b>		
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 alters the quality, use and integrity of the system/component but 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.
<b>REVERSIBILITY</b>		
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.
<b>IRREPLACEABLE LOSS OF RESOURCES</b>		
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.
<b>CUMULATIVE EFFECT</b>		
This describes the cumulative effect of the impacts. A cumulative impact is an effect which in itself may not be significant but may 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
<b>SIGNIFICANCE</b>		
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.		
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.

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

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

**Positive and negative impacts of the proposed activity**

The 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, socio economic, heritage and cultural aspects over all three different phases of the project.

#### Impacts during the construction phase

During the construction phase the following activities will have various potential impacts on the biophysical and socio-economic environment:

- Listing Notice GNR 983, Activity 27:"The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation."

During the construction phase minor negative impacts are foreseen over the short term. The latter refers to a period of months. The potentially most significant impacts relate to the impacts on the fauna and flora, soil, geology, existing service infrastructure, surface water (storm water), socio-economic impacts such as the provision of temporary employment and other economic benefits, and the impacts on heritage resources.

#### Impacts during the operational phase

During the operational phase the study area will serve as a diamond alluvial & diamond general mine and the potential negative impacts relate to:

- Listing Notice GNR 983, Activity 21:"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."

The potential impacts will take place over a period of 3-5 years. The negative impacts are generally associated with impacts on the soils, geology, surface water (storm water), and visual impacts. The operational phase will have a direct positive impact through the provision of employment opportunities and the generation of income to the local community.

#### Decommissioning phase (mine closure and rehabilitation)

In the case of the proposed facility the mine closure and rehabilitation phase is likely to involve the disassembly and closure of the mine. However, the physical environment will benefit from the closure of the mine since the site will be restored to its natural state. The decommissioning phase will however result in the loss of permanent employment. However, skilled staff will be eminently employable and a number of temporary jobs will also be created in the process

- vi. **The possible mitigation measures that could be applied and the level of risk.** (With regard to the issues and concerns raised by affected parties provide a list of the issues raised and an assessment/discussion of the mitigations or site layout alternatives available to accommodate or address their concerns, together with an assessment of the impacts or risks associated with the mitigation or alternatives considered).

No adverse environmental or social impacts associated with the establishment of a diamond alluvial & diamond general mine have been identified through the Basic Assessment process. Mitigation measures as set out in the Environmental Management Programme (EMPr) attached in Part B must be implemented in order to minimise any potential impacts.

All comments received during the review period of the draft Basic Assessment report, as well as response provided will be captured and recorded within the Comments and Response Report and will be attached in the final Basic Assessment Report.

- vii. **Motivation where no alternative sites were considered.**

This alternative asks the question, if there is not, from an environmental perspective, a more suitable location for the proposed activity. No other properties have at this stage been secured by Veronica Dineo Ntsekeletsa near Christiana on a certain portion of 4.9 hectares on the Remaining Extent of Portion 1 of the farm Christiana Town & Townlands 325, Registration Division: HO, North West Province is preferred due to the sites underlying alluvial diamond and diamond general bearing gravel (i.e. to facilitate the movement of machinery, equipment, infrastructure and).

**viii. Statement motivating the alternative development location within the overall site. (Provide a statement motivating the final site layout that is proposed)**

Design alternatives were considered throughout the planning and design phase (i.e. where is the rock bed located?). In this regard discussions on the design were held between the EAP and the developer. The layout follows the limitations of the site and aspects such as, roads, site offices and workshop area as well as fencing.

**i) Full description of the process undertaken to identify, assess and rank the impacts and risks the activity will impose on the preferred site (In respect of the final site layout plan) through the life of the activity. (Including (i) a description of all environmental issues and risks that are 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.)**

**Process for the identification of key issues**

The methodology for the identification of key issues aims, as far as possible, to provide a user-friendly analysis of information to allow for easy interpretation.

- **Checklist:** The checklist consists of a list of structured questions related to the environmental parameters and specific human actions. They assist in ordering thinking, data collection, presentation and alert against the omission of possible impacts.
- **Matrix:** The matrix analysis provides a holistic indication of the relationship and interaction between the various activities, development phases and the impact thereof on the environment. The method aims at providing a first order cause and effect relationship between the environment and the proposed activity. The matrix is designed to indicate the relationship between the different stressors and receptors which leads to specific impacts. The matrix also indicates the specialist studies, which are submitted as part of the BAR in order to address the potentially most significant impacts.

**Checklist analysis**

The purpose of the site visit is to ensure a proper analysis of the site specific characteristics of the study area. The table below provides a checklist, which is designed to stimulate thought regarding possible consequences of specific actions and so assist scoping of key issues. It consists of a list of structured questions related to the environmental parameters and specific human actions. They assist in ordering thinking, data collection, presentation and alert against the omission of possible impacts. The table highlights certain issues, which are further analysed in matrix.

**Table: Environmental checklist**

QUESTION	YES	NO	Un-sure	Description
<b>1. Are any of the following located on the site earmarked for the development?</b>				
I. A river, stream, dam or wetland		X		None
II. A conservation or open space area		X		None.
III. An area that is of cultural importance		X		None
IV. Site of geological significance		X		None.



V. Areas of outstanding natural beauty		×		None.
VI. Highly productive agricultural land		×		None
VII. Floodplain		×		None.
VIII. Indigenous forest		×		None.
IX. Grass land		×		None.
X. Bird nesting sites		×		None
XI. Red data species			×	
XII. Tourist resort		×		None.
<b>2. Will the project potentially result in potential?</b>				
I. Removal of people		×		None.
II. Visual Impacts	×			The visual impact will be managed by placing stockpiles on the boundaries closer to the road As much existing vegetation as possible may be retained, specifically bushes and trees This will assist to conceal the development
III. Noise pollution	×			The noise impact will be managed.
IV. Construction of an access road		×		None. Access will be obtained from gravel roads off the R506.
V. Risk to human or valuable ecosystems due to explosion/fire/ discharge of waste into water or air.		×		None.
VI. Accumulation of large workforce (>50 manual workers) into the site.		×		Approximately 15 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.	×			Washing pan which utilise approximately 17 000 L per hour each from which 30% is re-used.
VIII. Job creation	X			Approximately 10-15 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 prospecting will be cleared. The prospecting will be phased and the topsoil stockpiled separately. Concurrent rehabilitation will take place. The soil also has a low erosion potential.
XI. Installation of additional bulk telecommunication transmission lines or facilities		×		None.
<b>3. Is the proposed project located near the following?</b>				
I. A river, stream, dam or wetland		×		A watercourse flows approximate 800m from the proposed mining area and is characterised as a Class-D river which indicates that it is Largely Modified. According to the wetland areas map a floodplain wetland is approximately 800m from the proposed 4.9ha.
II. A conservation or open space area		×		None.
III. An area that is of cultural importance		×		None.
IV. A site of geological significance		×		None.
V. An area of outstanding natural beauty		×		None.

VI. Highly productive agricultural land		×		None.
VII. A tourist resort		×		None.
VIII. A formal or informal settlement		×		None

Matrix analysis

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 conceptualise 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 minimise the effect on the environment.

**j) Assessment of each identified potentially significant impact and risk**

(This section of the report must consider all the known typical impacts of each of the activities (including those that could or should have been identified by knowledgeable persons) and not only those that were raised by registered interested and affected parties).

**Matrix Analysis**

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		
<b>CONSTRUCTION PHASE</b>									
<p><u>Activity 27 (Regulation 983):</u>                      "The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation."</p>	<p><u>Site clearing and preparation</u>                      Areas earmarked for prospecting will need to be cleared, topsoil will be stockpiled separately.</p>	BIOPHYSICAL ENVIRONMENT	Fauna & Flora	<ul style="list-style-type: none"> <li>Loss or fragmentation of indigenous natural vegetation.</li> <li>Loss of sensitive species.</li> <li>Loss or fragmentation of habitats.</li> </ul>		-	S	Yes	-
			Air	<ul style="list-style-type: none"> <li>Air pollution due to the increase of traffic of construction vehicles.</li> </ul>	-		S	Yes	-
			Soil	<ul style="list-style-type: none"> <li>Soil degradation, including erosion.</li> <li>Loss of topsoil.</li> <li>Disturbance of soils and existing land use (soil compaction).</li> </ul>		-	S	Yes	-
			Geology	<ul style="list-style-type: none"> <li>It is not foreseen that the removal of indigenous vegetation will impact on the geology or vice versa.</li> </ul>		-	S	Yes	-
			Existing services infrastructure	<ul style="list-style-type: none"> <li>Generation of waste that need to be accommodated at a licensed landfill site.</li> <li>Generation of sewage that need to be accommodated by the local sewage plant.</li> </ul>		-	S	Yes	-
			Ground water	<ul style="list-style-type: none"> <li>Pollution due to construction vehicles.</li> </ul>	-		S	Yes	-
			Surface water	<ul style="list-style-type: none"> <li>Increase in storm water run-off.</li> <li>Pollution of water sources due to soil erosion.</li> <li>Destruction of watercourses (pans).</li> </ul>		-	S	Yes	-
		SOCIAL/ECONOMIC ENVIRONMENT	Local unemployment rate	<ul style="list-style-type: none"> <li>Job creation.</li> <li>Business opportunities.</li> <li>Skills development.</li> </ul>		+	S	Yes	-
			Visual landscape	<ul style="list-style-type: none"> <li>Potential visual impact on residents of farmsteads and motorists in close proximity to proposed facility.</li> </ul>		-	S	Yes	-
			Traffic volumes	<ul style="list-style-type: none"> <li>Increase in construction vehicles.</li> </ul>	-		S	Yes	-

			Health & Safety	<ul style="list-style-type: none"> <li>Air/dust pollution.</li> <li>Road safety.</li> <li>Increased risk of veld fires.</li> </ul>		-	S	Yes	-
			Noise levels	<ul style="list-style-type: none"> <li>The generation of noise as a result of construction vehicles, the use of machinery such as drills and people working on the site.</li> </ul>		-	S	Yes	-
			Tourism industry	<ul style="list-style-type: none"> <li>Since there are no tourism facilities in close proximity to the site, the proposed activities will not have an impact on tourism in the area.</li> </ul>	N/A	N/A	N/A	N/A	-
			Heritage resources	<ul style="list-style-type: none"> <li>Removal or destruction of archaeological and/or paleontological sites.</li> <li>Removal or destruction of buildings, structures, places and equipment of cultural significance.</li> <li>Removal or destruction of graves, cemeteries and burial grounds.</li> </ul>		-	S	Yes	-
<p><b>Activity 27 (Regulation 983):</b>  <i>"The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation."</i></p>	<p><b>Site clearing and preparation</b>                      Certain areas of the site will need to be cleared of vegetation. This will inevitably result in the removal of indigenous vegetation located on the site.</p>	BIOPHYSICAL ENVIRONMENT	Fauna & Flora	<ul style="list-style-type: none"> <li>Loss or fragmentation of indigenous natural vegetation.</li> <li>Loss of sensitive species.</li> <li>Loss or fragmentation of habitats.</li> </ul>		-	S	Yes	-
			Air quality	<ul style="list-style-type: none"> <li>Air pollution due to the increase of traffic.</li> </ul>	-		S	Yes	-
			Soil	<ul style="list-style-type: none"> <li>Soil degradation, including erosion.</li> <li>Disturbance of soils and existing land use (soil compaction).</li> <li>Loss of agricultural potential (low significance relative to agricultural potential of the site).</li> </ul>	-		S	Yes	-
			Geology	<ul style="list-style-type: none"> <li>It is not foreseen that the removal of indigenous vegetation will impact on the geology or vice versa.</li> </ul>	N/A	N/A	N/A	N/A	-
			Existing services infrastructure	<ul style="list-style-type: none"> <li>Generation of waste that need to be accommodated at a licensed landfill site.</li> <li>Generation of sewage that need to be accommodated by the local sewage plant.</li> </ul>	-		S	Yes	-
			Ground water	<ul style="list-style-type: none"> <li>Pollution due to construction vehicles.</li> </ul>	-		S	Yes	-
			Surface water	<ul style="list-style-type: none"> <li>Increase in storm water run-off.</li> <li>Pollution of water sources due to soil erosion.</li> <li>Destruction of watercourses (pans).</li> </ul>	-		S	Yes	-
		SOCIAL/ECONOMIC ENVIRONMENT	Local unemployment rate	<ul style="list-style-type: none"> <li>Job creation.</li> <li>Skills development.</li> </ul>		+	S	N/A	-
			Visual landscape	<ul style="list-style-type: none"> <li>Potential visual impact on residents of farmsteads and motorists in close proximity to proposed facility due to dust.</li> </ul>		-	S	Yes	-

			Traffic volumes	<ul style="list-style-type: none"> <li>Increase in construction vehicles.</li> </ul>	-		S	Yes	-
			Health & Safety	<ul style="list-style-type: none"> <li>Air/dust pollution.</li> <li>Road safety.</li> </ul>		-	S	Yes	-
			Noise levels	<ul style="list-style-type: none"> <li>The generation of noise as a result of construction vehicles, and people working on the site.</li> </ul>	-		S	Yes	-
			Tourism industry	<ul style="list-style-type: none"> <li>Since there are no tourism facilities in close proximity to the site, the proposed activity will not have an impact on tourism in the area.</li> </ul>	N/A	N/A	N/A	N/A	-
			Heritage resources	<ul style="list-style-type: none"> <li>Removal or destruction of archaeological and/or paleontological sites.</li> <li>Removal or destruction of buildings, structures, places and equipment of cultural significance.</li> <li>Removal or destruction of graves, cemeteries and burial grounds.</li> </ul>	N/A	N/A	N/A	N/A	-
<b>OPERATIONAL PHASE</b>									
<p><b>Activity 21 (Regulation 983): "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."</b></p>	<p>The key components of the proposed project are described below:</p> <ul style="list-style-type: none"> <li><b>Supporting Infrastructure</b> - A control facility with basic services such as water and electricity will be constructed on the site and will have an approximate footprint 50m<sup>2</sup> or less. Other supporting infrastructure includes a site office and workshop area.</li> <li><b>Roads</b> – Access will be obtained from a local gravel roads off the R34. All site roads will require a width of approximately 10m.</li> <li><b>Fencing</b> - For health, safety and security reasons, the facility will be required to be fenced off from the surrounding farm.</li> </ul>	<b>BIOPHYSICAL ENVIRONMENT</b>	Fauna & Flora	<ul style="list-style-type: none"> <li>Fragmentation of habitats.</li> <li>Establishment and spread of declared weeds and alien invader plants (operations).</li> </ul>		-	L	Yes	-
			Air quality	<ul style="list-style-type: none"> <li>Air pollution due to the mining activity</li> </ul>	N/A	N/A	N/A	N/A	-
			Soil	<ul style="list-style-type: none"> <li>Soil degradation, including erosion.</li> <li>Disturbance of soils and existing land use (soil compaction).</li> <li>Loss of agricultural potential (low significance relative to agricultural potential of the site).</li> </ul>		-	L	Yes	-
			Geology	<ul style="list-style-type: none"> <li>Collapsible soil.</li> <li>Seepage (shallow water table).</li> <li>Active soil (high soil heave).</li> <li>Erodible soil.</li> <li>The presence of undermined ground.</li> <li>Instability due to soluble rock.</li> <li>Steep slopes or areas of unstable natural slopes.</li> <li>Areas subject to seismic activity.</li> <li>Areas subject to flooding.</li> </ul>		-	S	Yes	-
			Existing services infrastructure	<ul style="list-style-type: none"> <li>Generation of waste that need to be accommodated at a licensed landfill site.</li> <li>Generation of sewage that need to be accommodated by the municipal sewerage system and the local sewage plant.</li> <li>Increased consumption of water. Approximately 17 000 L per hour</li> </ul>		-	L	Yes	-
			Ground water	<ul style="list-style-type: none"> <li>Leakage of hazardous materials. The machinery on site require oils and fuel to function. Leakage of these oils and fuels can contaminate water supplies.</li> </ul>	-		L	Yes	-

			Surface water	<ul style="list-style-type: none"> <li>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.</li> <li>Destruction of watercourses (pans).</li> <li>Leakage of hazardous materials. The machinery on site require oils and fuel to function. Leakage of these oils and fuels can contaminate water supplies.</li> </ul>		-	L	Yes	-
		SOCIAL/ECONOMIC ENVIRONMENT	Local unemployment rate	<ul style="list-style-type: none"> <li>Job creation. Security guards will be required for 24 hours every day of the week</li> <li>Skills development.</li> </ul>		+	L	Yes	-
			Visual landscape	<ul style="list-style-type: none"> <li>Change in land-use/sense of place. The site is characterized by open veldt or natural covered. The proposed area is vacant municipality land. The use of the area for the prospecting activity will result in the area being used until rehabilitated.</li> </ul>		-	L	Yes	-
			Traffic volumes	<ul style="list-style-type: none"> <li>Increase in vehicles collecting diamond bins for distribution.</li> </ul>	-		S	Yes	-
			Health & Safety	<ul style="list-style-type: none"> <li>Air/dust pollution.</li> <li>Road safety.</li> </ul>	N/A	N/A	N/A	N/A	-
			Noise levels	<ul style="list-style-type: none"> <li>The proposed development will result in noise pollution during the operational phase.</li> </ul>	-	-	S	Yes	-
			Tourism industry	<ul style="list-style-type: none"> <li>Since there are no tourism facilities in close proximity to the site, the decommissioning activities will not have an impact on tourism in the area.</li> </ul>	N/A	N/A	N/A	N/A	-
			Heritage resources	<ul style="list-style-type: none"> <li>It is not foreseen that the proposed activity will impact on heritage resources or vice versa.</li> </ul>	N/A	N/A	N/A	N/A	-
<b>DECOMMISSIONING PHASE</b>									
-	<p><u>Mine closure</u> During the mine closure the Mine and its associated infrastructure will be dismantled.</p> <p><u>Rehabilitation of biophysical environment</u> The biophysical environment will be rehabilitated.</p>	BIOPHYSICAL ENVIRONMENT	Fauna & Flora	<ul style="list-style-type: none"> <li>Re-vegetation of exposed soil surfaces to ensure no erosion in these areas.</li> </ul>	+		L	Yes	-
			Air quality	<ul style="list-style-type: none"> <li>Air pollution due to the increase of traffic of construction vehicles.</li> </ul>	-		S	Yes	-
			Soil	<ul style="list-style-type: none"> <li>Backfilling of all voids</li> <li>Placing of topsoil on backfill</li> </ul>	+		L	Yes	-
			Geology	<ul style="list-style-type: none"> <li>It is not foreseen that the decommissioning phase will impact on the geology of the site or vice versa.</li> </ul>	N/A	N/A	N/A	N/A	-
			Existing services infrastructure	<ul style="list-style-type: none"> <li>Generation of waste that need to be accommodated at the local landfill site.</li> <li>Generation of sewage that need to be accommodated by the municipal sewerage system and the local sewage plant.</li> <li>Increase in construction vehicles.</li> </ul>	-		S	Yes	-
			Ground water	<ul style="list-style-type: none"> <li>Pollution due to construction vehicles.</li> </ul>	-		S	Yes	-
			Surface water	<ul style="list-style-type: none"> <li>Increase in storm water run-off.</li> <li>Pollution of water sources due to soil erosion.</li> <li>Destruction of watercourses (wetlands &amp; pans).</li> </ul>	-		S	Yes	-
		SOCI AL/EC	Local unemployment rate	<ul style="list-style-type: none"> <li>Loss of employment.</li> </ul>		-	L	Yes	-

		Visual landscape	<ul style="list-style-type: none"> <li>Potential visual impact on visual receptors in close proximity to proposed facility.</li> </ul>	-	-	S	Yes	-
		Traffic volumes	<ul style="list-style-type: none"> <li>Increase in construction vehicles.</li> </ul>	-		S	Yes	-
		Health & Safety	<ul style="list-style-type: none"> <li>Air/dust pollution.</li> <li>Road safety.</li> <li>Increased crime levels. The presence of mine workers on the site may increase security risks associated with an increase in crime levels as a result of influx of people in the rural area.</li> </ul>	-		S	Yes	-
		Noise levels	<ul style="list-style-type: none"> <li>The generation of noise as a result of construction vehicles, the use of machinery and people working on the site.</li> </ul>	-		S	Yes	-
		Tourism industry	<ul style="list-style-type: none"> <li>Since there are no tourism facilities in close proximity to the site, the decommissioning activities will not have an impact on tourism in the area.</li> </ul>	N/A	N/A	N/A	N/A	-
		Heritage resources	<ul style="list-style-type: none"> <li>It is not foreseen that the decommissioning phase will impact on any heritage resources.</li> </ul>	N/A	N/A	N/A	N/A	-

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

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**k) Summary of specialist reports.**

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

*No specialist studies were undertaken for this Basic Assessment*

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X where applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED.



## **l) Environmental impact statement**

### **(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 area. In doing so, it draws on the information gathered as part of the basic assessment process and the knowledge gained by the environmental consultant 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 land use: the proposed area is vacant municipality land. The activity will only comprise 4.9 Ha, so the area will not have any significant impact on the land use nor will it change the sense of place of the area.
- 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 medium-high 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 diamond alluvial & diamond general mine will have socio-economic benefit to the area.

All possible negative impacts and risks that have been identified in this report 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 mining permit be granted.

### **(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 Locality Map attached in **Appendix B**.

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

There are regional socio economic benefits due to the diamond alluvial & diamond general mine being mined in the North West Province. 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. No significantly adverse social or environmental impacts are anticipated.

## **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.**

Management objectives include:

- Ensure that the mining activity does not cause pollution to the environment or harm to persons.
- Minimise production of waste.
- All mining 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 diamond alluvial & diamond general mine.
- Compliance with legislative requirements.
- Mine is neat and tidy and well managed.

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

Any aspects which must be made conditions of the Environmental Authorisation

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

**o) Description of any assumptions, uncertainties and gaps in knowledge.**

(Which relate to the assessment and mitigation measures proposed)

The uncertainties in results are mostly related to the availability of information, time available to gather the relevant information as well as the sometimes subjective nature of the assessment methodology. In terms of addressing the key issues the EAP is satisfied that there are no major gaps in knowledge and that the specialist reports provide sufficient information to conduct the significance rating and provide the environmental authority with sufficient information to make an informed decision.

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

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

Based on the outcomes of other mines in the area. The proposed prospecting area is targeted as, historically, several diamond alluvial & diamond general occurrences are known in the area, and a number of these have been exploited in the past. There are also various diamond alluvial & diamond general mine operations within the vicinity of the exploration area.

No other properties have been secured by the applicant and the site is therefore regarded as the preferred site, and alternatives are not considered.

The option of not approving the activities will result in a significant loss to valuable deposits being exploited. And all economic benefits will be lost.

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

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

The EMPr should be binding on all managers and contractors operating/utilizing the site.

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

For the lifetime of the mine, 5-7 years.

- r) **Undertaking:** Confirm that the undertaking required to meet the requirements of this section is provided at the end of the EMPr and is applicable to both the Basic assessment report and the Environmental Management Programme report.

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

**s) Financial Provision**

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

Still to be calculated

Mining will be restricted to the 4.9 Ha applied for. For every 0.98 Ha there will be no more than 10 trenches at any given time, which will be dug.

$$\frac{4.9 \text{ hectern}}{50 \text{ trenches}} = 0.098 \text{ Ha per trench}$$

- 4.9 Ha- (40m x 24.5m) trench = 10 trenches every hectare. The total area to be disturbed at any given time will be- 4 trenches x (40m x 24.5m) = 0.392 Ha at any given time
- No more than 0.392 Ha (4 Trenches) will be left as un-rehabilitated. Rehabilitation will be done concurrently.

Rehabilitation will be taking place continuously and therefore only a small area (0.392 Ha) will be left un-rehabilitated at the end of mining activities, which will require the amount provided in the quantum.

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

The closure cost estimate provided above is aligned with the Guideline Document for the Evaluation of Quantum of Closure related Financial Provision Provided by a Mine, by the DMR (January, 2005). The amount was calculated by Milnex 189 CC.

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

**Financial Guarantee**

The financial guarantee for the rehabilitation for land disturbed by Veronica Dineo Ntsekeletsa was submitted together with the application for the mining permit.

**Rehabilitation Fund**

Veronica Dineo Ntsekeletsa will also make provision for rehabilitation during closure by establishing a rehabilitation trust.

**t) Specific Information required by the competent Authority**

**i) Compliance with the provisions of sections 24(4)(a) and (b) read with section 24 (3) (a) and (7) of the National Environmental Management Act (Act 107 of 1998). the EIA report must include the:-**

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

The diamond alluvial & diamond general mine will not impact directly on any socio-economic aspects. Indirect socio-economic benefits are expected to be associated with the creation of employment.

**(2) Impact on any national estate referred to in section 3(2) of the National Heritage Resources Act.** (Provide the results of Investigation, assessment, and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any national estate referred to in section 3(2) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) with the exception of the national estate contemplated in section 3(2)(i)(vi) and (vii) of that Act, attach the investigation report as **Appendix 2.19.2** and confirm that the applicable mitigation is reflected in 2.5.3; 2.11.6. and 2.12. herein).

Diamond alluvial & diamond general mine will not impact on any heritage estate referred to in section 3(2) of the National Heritage Resources Act.

In terms of the National Heritage Resource Act no 25 of 1999. Heritage resources including archaeological and paleontological sites over 100 years old, graves older than 60 years, structure older than 60 years are protected. They may 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 will stop.

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

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

From a local perspective, a certain portion of 4.9 hectares on the Remaining Extent of Portion 1 of the farm Christiana Town & Townlands 325, Registration Division HO in the North West Province is preferred due to the sites underlying geology and the shallowness of the bedrock to the surface as well as site access (i.e. to facilitate the movement of machinery, equipment, infrastructure and people and the transport of the aggregate to the designated areas). No other properties have been secured by Veronica Dineo Ntsekeletsa. The specific site has been chosen for its mineral resources thus making an alternative site selection null and void.

# PART B

## ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

### 1) Environmental management programme.

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

Name of Practitioner: Percy Sehaole  
Tel No.: (018) 011 1925  
Fax No.: (053) 963 2009  
e-mail address: [percy@milnex-sa.co.za](mailto:percy@milnex-sa.co.za)

Name of Practitioner: Danie Labuschagne  
Tel No.: (018) 011 1925  
Fax No.: (053) 963 2009  
e-mail address: [danie@milnex-sa.co.za](mailto:danie@milnex-sa.co.za)

Percy Sehaole holds a Master's Degree in Environmental Science (refer to **Appendix 1**)

Danie Labuschagne holds a Master's Degree in Environmental Management and Geography (refer to **Appendix 1**)

The Curriculum Vitae for the responsible EAP's are contained in **Appendix 2**.

- b) **Description of the Aspects of the Activity** (Confirm that the requirement to describe the aspects of the activity that are covered by the draft environmental management programme is already included in PART A, section (1)(h) herein as required).

It is hereby confirmed that the requirements to describe the aspects of the activity that are required by the draft EMP is already included in Part A, section 1(h).

c) **Composite Map**

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

Refer to Locality Map, attached as in Appendix 3.

d) **Description of Impact management objectives including management statements**

- i) **Determination of closure objectives.** (ensure that the closure objectives are informed by the type of environment described)

Closure objectives for the diamond alluvial & diamond general mine 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:

- 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.
- It should be noted that the site will not be able to be completely backfilled as it will be an open cast mine due to the removal of diamond alluvial & diamond general. Therefore, there will be no to little material to backfill. Material. After all the foreign matter, has been removed from the sites, the excavations shall backfilled be as far as possible. No foreign matter such as cement or other rubble shall be introduced into such backfilling.

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

17 0000 L per hour required for the 1 x 16 wash plant.

iii) **Has a water use licence has been applied for?**

A water use license application will be applied for, if required.

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iv) 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 (volumes, tonnages and hectares or m <sup>2</sup> )	MITIGATION MEASURES (describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)	COMPLIANCE WITH STANDARDS (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	TIME PERIOD FOR IMPLEMENTATION Describe the time period when the measures in the environmental management programme must be implemented. Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either:- Upon cessation of the individual activity Or Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
E.g. For mining, - excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams & boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc)	(of operation in which activity will take place.  State; Planning and design, Pre-Construction, Construction, Operational, Rehabilitation, Closure, Post closure).				
Clearance of vegetation	Construction Phase	4.9 Ha	<ol style="list-style-type: none"> <li>1. Site clearing must take place in a phased manner, as and when required.</li> <li>2. Areas which are not to be constructed on within two months must not be cleared to reduce erosion risks.</li> <li>3. The area to be cleared must be clearly demarcated and this footprint strictly maintained.</li> <li>4. Spoil that is removed from the site must be removed to an approved spoil site or a licensed landfill site.</li> <li>5. The necessary silt fences and erosion control measures must be implemented in areas where these risks are more prevalent.</li> </ol>	Compliance with Duty of Care as detailed within NEMA	Duration of operations on the mine
Construction of roads	Construction and Operational Phase		<ol style="list-style-type: none"> <li>1. Planning of access routes to the site for construction purposes</li> </ol>	Compliance with Duty of Care as detailed within NEMA	Duration of operations on the mine

			<p>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 for construction vehicles" sign.</p> <ol style="list-style-type: none"><li>2. Construction routes and required access roads must be clearly defined.</li><li>3. Damping down of the un-surfaced roads must be implemented to reduce dust and nuisance.</li><li>4. Soils compacted by construction shall be deep ripped to loosen compacted layers and re-graded to even running levels.</li><li>5. The contractor must ensure that damage caused by related traffic to the gravel access road off the R31 is repaired continuously. The costs associated with the repair must be borne by the contractor;</li><li>6. Dust suppression measures must be implemented for heavy vehicles such as wetting of gravel roads on a regular basis;</li><li>7. 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.</li></ol>	
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<p>Diamond alluvial &amp; diamond general mine – Soils and geology</p>	<p>Operational Phase</p>	<p>4.9 Ha</p>	<ol style="list-style-type: none"> <li>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.</li> <li>2. Care must be taken not to mix topsoil and subsoil during stripping.</li> <li>3. The topsoil must be conserved on site in and around the pit area.</li> <li>4. Subsoil and overburden in the mining area should be stockpiled separately to be returned for backfilling in the correct soil horizon order.</li> <li>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.</li> <li>6. Stockpiles should be kept clear of weeds and alien vegetation growth by regular weeding.</li> </ol>	<p>Compliance with Duty of Care as detailed within NEMA</p>	<p>Duration of operations on the mine</p>
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			<p>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.</p> <p>8. The impact on the geology will be permanent. There is no mitigation measure.</p>		
Diamond alluvial & diamond general mine – excavations	Operational Phase	4.9 Ha	<p>1. The mining activities must aim to adhere to the relevant noise regulations and limit noise to within standard working hours in order to reduce disturbance of dwellings in close proximity to the development.</p> <p>2. Mine, pans, workshops and other noisy fixed facilities should be 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 in to the system.</p> <p>3. Truck traffic should be routed away from noise sensitive areas, where possible.</p> <p>4. Noise levels must be kept within acceptable limits.</p>	Compliance with Duty of Care as detailed within NEMA	Duration of operations on the mine

			<ol style="list-style-type: none"><li>5. Noisy operations should be combined so that they occur where possible at the same time.</li><li>6. Mine workers to wear necessary ear protection gear.</li><li>7. Noisy activities to take place during allocated hours.</li><li>8. Noise from labourers must be controlled.</li><li>9. Noise suppression measures must be applied to all equipment. Equipment must be kept in good 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.</li><li>10. The Contractor must take measures to discourage labourers from loitering in the area and causing noise disturbance. Where possible labour shall be transported to and from the site by the Contractor or his Sub-Contractors by the Contractors own transport.</li><li>11. Implementation of enclosure and cladding of processing plants.</li><li>12. Applying regular and thorough maintenance schedules to equipment and processes. An increase in noise emission levels very often is a sign of the</li></ol>	
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			imminent mechanical failure of a machine.		
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**e) Impact Management Outcomes**

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

<b>ACTIVITY</b> (whether listed or not listed).  (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.).	<b>POTENTIAL IMPACT</b>  (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc....etc...)	<b>ASPECTS AFFECTED</b>	<b>PHASE</b> In which impact is anticipated  (e.g. Construction, commissioning, operational Decommissioning, closure, post-closure)	<b>MITIGATION TYPE</b>  (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. etc)  E.g. <ul style="list-style-type: none"> <li>• Modify through alternative method.</li> <li>• Control through noise control</li> <li>• Control through management and monitoring</li> <li>• Remedy through rehabilitation..</li> </ul>	<b>STANDARD TO BE ACHIEVED</b>  (Impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives) etc.
Clearance of vegetation	Loss or fragmentation of habitats	Fauna & flora	Construction & Operational Phase	<b>Existing vegetation</b> <ol style="list-style-type: none"> <li>1. Vegetation removal must be limited to the mining site.</li> <li>2. Vegetation to be removed as it becomes necessary rather than removal of all vegetation throughout the site in one step.</li> <li>3. No vegetation to be used for firewood.</li> <li>4. Exotic and invasive plant species should not be allowed to establish, if the development is approved.</li> </ol> <b>Rehabilitation</b> <ol style="list-style-type: none"> <li>5. All damaged areas shall be rehabilitated upon completion of the contract.</li> <li>6. Re-vegetation of the disturbed site is aimed at approximating as near as possible the natural</li> </ol>	Minimisation of impacts to acceptable limits

				<p>vegetative conditions prevailing prior to construction.</p> <ol style="list-style-type: none"> <li>7. All natural areas impacted during construction must be rehabilitated with locally indigenous grasses typical of the representative botanical unit.</li> <li>8. Rehabilitation must take place in a phased approach as soon as possible.</li> <li>9. Rehabilitation process must make use of species indigenous to the area. Seeds from surrounding seed banks can be used for re-seeding.</li> <li>10. Rehabilitation must be executed in such a manner that surface run-off will not cause erosion of disturbed areas.</li> <li>11. Planting of indigenous tree species in areas not to be cultivated or built on must be encouraged.</li> </ol> <p><b>Demarcation of mining area</b></p> <ol style="list-style-type: none"> <li>12. All plants not interfering with mining operations shall be left undisturbed clearly marked and indicated on the site plan.</li> <li>13. The mining area must be well demarcated and no construction activities must be allowed outside of this demarcated footprint.</li> <li>14. Vegetation removal must be phased in order to reduce impact of construction.</li> <li>15. Site office and laydown areas must be clearly demarcated and no encroachment must occur beyond demarcated areas.</li> <li>16. Strict and regular auditing of the mining process to ensure containment of the mining and laydown areas.</li> <li>17. 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.</li> </ol>	
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				<p><b>Utilisation of resources</b></p> <p>18. Gathering of firewood, fruit, muti plants, or any other natural material onsite or in areas adjacent to the site is prohibited unless with prior approval of the ECO.</p> <p><b>Exotic vegetation</b></p> <p>19. Alien vegetation on the site will need to be controlled.</p> <p>20. 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.</p> <p>21. The spread of exotic species occurring throughout the site should be controlled.</p> <p><b>Herbicides</b></p> <p>22. 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.</p> <p>23. The use of pesticides and herbicides on the site must be discouraged as these impact on important pollinator species of indigenous vegetation.</p> <p><b>Fauna</b></p> <p>24. Rehabilitation to be undertaken as soon as possible after mining has been completed.</p> <p>25. No trapping or snaring to fauna on the construction site should be allowed.</p>	
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				26. No faunal species must be disturbed, trapped, hunted or killed by maintenance staff during any routine maintenance at the development.	
Diamond alluvial & diamond general mine – excavations	Loss of topsoil	Soil	Construction & Operational Phase	<p>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.</p> <p>2. Care must be taken not to mix topsoil and subsoil during stripping.</p> <p>3. The topsoil must be conserved on site in and around the pit area.</p> <p>4. Subsoil and overburden in the mining area should be stockpiled separately to be returned for backfilling in the correct soil horizon order.</p> <p>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.</p> <p>6. Stockpiles should be kept clear of weeds and alien vegetation growth by regular weeding.</p> <p>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.</p>	Minimisation of impacts to acceptable limits

				<p>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.</p> <ul style="list-style-type: none"> <li>• Record the GPS coordinates of each area.</li> <li>• Record the date of topsoil stripping.</li> <li>• Record the GPS coordinates of where the topsoil is stockpiled.</li> <li>• Record the date of cessation mining activities at the particular site.</li> <li>• Photograph the area on cessation of mining activities.</li> <li>• Record date and depth of re-spreading of topsoil.</li> <li>• Photograph the area on completion of rehabilitation and on an annual basis thereafter to show vegetation establishment and evaluate progress of restoration over time.</li> </ul>	
	Erosion	Soil Air Water	Construction & Operational Phase	<ol style="list-style-type: none"> <li>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.</li> <li>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.</li> <li>3. Wind screening and stormwater control should be undertaken to prevent soil loss from the site.</li> <li>4. The use of silt fences and sand bags must be implemented in areas that are susceptible to erosion.</li> <li>5. Other erosion control measures that can be implemented are as follows:</li> </ol>	Minimisation of impacts to acceptable limits



				<ul style="list-style-type: none"> <li>○ Brush packing with cleared vegetation</li> <li>○ Mulch or chip packing</li> <li>○ Planting of vegetation</li> <li>○ Hydroseeding/hand sowing</li> </ul> <p>6. Sensitive areas need to be identified prior to construction so that the necessary precautions can be implemented.</p> <p>7. All erosion control mechanisms need to be regularly maintained.</p> <p>8. Seeding of topsoil and subsoil stockpiles to prevent wind and water erosion of soil surfaces.</p> <p>9. Retention of vegetation where possible to avoid soil erosion.</p> <p>10. Vegetation clearance should be phased to ensure that the minimum area of soil is exposed to potential erosion at any one time.</p> <p>11. Re-vegetation of disturbed surfaces should occur immediately after construction activities are completed. This should be done through seeding with indigenous grasses.</p> <p>12. No impediment to the natural water flow other than approved erosion control works is permitted.</p> <p>13. 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 be submitted to the Engineer for approval and must include the location and design criteria of any temporary stream crossings.</p> <p>14. Stockpiles not used in three (3) months after stripping must be seeded to prevent dust and erosion.</p>	
	Air Pollution	Air	Construction & Operational Phase	<p><b>Dust control</b></p> <p>1. Wheel washing and damping down of un-surfaced and un-vegetated areas.</p>	Minimisation of impacts to acceptable limits

				<ol style="list-style-type: none"> <li>2. Retention of vegetation where possible will reduce dust travel.</li> <li>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.</li> <li>4. Damping down of all exposed soil surfaces with a water bowser or sprinklers when necessary to reduce dust.</li> <li>5. The Contractor shall be responsible for dust control on site to ensure no nuisance is caused to the neighbouring communities.</li> <li>6. A speed limit of 30km/h must not be exceeded on site.</li> <li>7. Any complaints or claims emanating from the lack of dust control shall be attended to immediately by the Contractor.</li> <li>8. Any dirt roads that are utilised by the workers must be regularly maintained to ensure that dust levels are controlled.</li> </ol> <p><b>Odour control</b></p> <ol style="list-style-type: none"> <li>9. Regular servicing of vehicles in order to limit gaseous emissions.</li> <li>10. Regular servicing of onsite toilets to avoid potential odours.</li> </ol> <p><b>Rehabilitation</b></p> <ol style="list-style-type: none"> <li>11. The Contractor should commence rehabilitation of exposed soil surfaces as soon as practical after completion of earthworks.</li> </ol> <p><b>Fire prevention</b></p> <ol style="list-style-type: none"> <li>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.</li> </ol>	
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				13. The Contractor shall have operational fire-fighting equipment available on site at all times. The level of firefighting equipment must be assessed and evaluated through a typical risk assessment process.	
	Noise		Construction & Operational Phase	<ol style="list-style-type: none"> <li>1. The mining activities must aim to adhere to the relevant noise regulations and limit noise to within standard working hours in order to reduce disturbance of dwellings in close proximity to the development.</li> <li>2. Mine, crushers, workshops and other noisy fixed facilities should be 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 in to the system.</li> <li>3. Truck traffic should be routed away from noise sensitive areas, where possible.</li> <li>4. Noise levels must be kept within acceptable limits.</li> <li>5. Noisy operations should be combined so that they occur where possible at the same time.</li> <li>6. Mine workers to wear necessary ear protection gear.</li> <li>7. Noisy activities to take place during allocated hours.</li> <li>8. Noise from labourers must be controlled.</li> <li>9. Noise suppression measures must be applied to all equipment. Equipment must be kept in good 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.</li> <li>10. The Contractor must take measures to discourage labourers from loitering in the area</li> </ol>	Minimisation of impacts to acceptable limits

				<p>and causing noise disturbance. Where possible labour shall be transported to and from the site by the Contractor or his Sub-Contractors by the Contractors own transport.</p> <ol style="list-style-type: none"> <li>11. Implementation of enclosure and cladding of processing plants.</li> <li>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.</li> </ol>	
	Impact on potential cultural and heritage artefacts	Heritage	Operational Phase	<ol style="list-style-type: none"> <li>1. Any finds must be reported to the nearest National Monuments office to comply with the National Heritage Resources Act (Act No 25 of 1999) and to DEA.</li> <li>2. Local museums as well as the South African Heritage Resource Agency (SAHRA) should be informed if any artefacts are uncovered in the affected area.</li> <li>3. The Contractor must ensure that his workforce is aware of the necessity of reporting any possible historical or archaeological finds to the ECO so that appropriate action can be taken.</li> <li>4. Any discovered artefacts 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 the SAHRA should the proposed site affect any world heritage sites or if any heritage sites are to be destroyed or altered.</li> </ol>	Minimisation of impacts to acceptable limits
Waste management		Pollution	Construction and Operational Phase	<p><b>Litter management</b></p> <ol style="list-style-type: none"> <li>1. Refuse bins must be placed at strategic positions to ensure that litter does not accumulate within the construction site.</li> </ol>	Minimisation of impacts to acceptable limits

				<ol style="list-style-type: none"> <li>2. The Contractor shall supply waste collection bins where such is not available and all solid waste collected shall be disposed of at registered/licensed landfill.</li> <li>3. Good housekeeping practices should be implemented to regularly maintain the litter and rubble situation on the construction site.</li> <li>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.</li> <li>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.</li> <li>6. Skip waste containers should be maintained on site. These should be kept covered and arrangements made for them to be collected regularly.</li> <li>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.</li> <li>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.</li> <li>9. A certificate of disposal shall be obtained by the Contractor and kept on file, if relevant.</li> <li>10. Under no circumstances may solid waste be burnt on site.</li> <li>11. All waste must be removed promptly to ensure that it does not attract vermin or produce odours.</li> </ol> <p><b>Hazardous waste</b></p> <ol style="list-style-type: none"> <li>12. All waste hazardous materials must be carefully stored as advised by the ECO, and then disposed of offsite at a licensed landfill site,</li> </ol>	
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				<p>where practical. Incineration may be used where relevant.</p> <ol style="list-style-type: none"> <li>13. Contaminants to be stored safely to avoid spillage.</li> <li>14. Machinery must be properly maintained to keep oil leaks in check.</li> <li>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.</li> </ol> <p><b>Sanitation</b></p> <ol style="list-style-type: none"> <li>16. The Contractor shall install mobile chemical toilets on the site.</li> <li>17. Staff shall be sensitised to the fact that they should use these facilities at all times. No indiscriminate sanitary activities on site shall be allowed.</li> <li>18. Toilets shall be serviced regularly and the ECO shall inspect toilets regularly.</li> <li>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.</li> <li>20. Under no circumstances may open areas, neighbours fences or the surrounding bush be used as a toilet facility.</li> <li>21. The construction of “Long Drop” toilets is forbidden, but rather toilets connected to the sewage treatment plant.</li> <li>22. Potable water must be provided for all construction staff.</li> </ol> <p><b>Remedial actions</b></p>	
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				<p>23. Depending on the nature and extent of the spill, contaminated soil must be either excavated or treated on-site.</p> <p>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.</p> <p>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.</p> <p>26. If a spill occurs on an impermeable surface such as cement or concrete, the surface spill must be contained using oil absorbent material.</p> <p>27. If necessary, oil absorbent sheets or pads must be attached to leaky machinery or infrastructure.</p> <p>28. Materials used for the remediation of petrochemical spills must be used according to product specifications and guidance for use.</p> <p>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.</p>	
Water Use and Quality	Water pollution	Water	Construction and Operational Phase	<p><b>Water Use</b></p> <p>1. Develop a sustainable water supply management plan to minimise the impact to natural systems by managing water use, avoiding depletion of aquifers and minimising impacts to water users.</p> <p>2. Water must be reused, recycled or treated where possible.</p> <p><b>Water Quality</b></p> <p>3. The quality and quantity of effluent streams discharged to the environment including</p>	

				<p>stormwater should be managed and treated to meet applicable effluent discharge guidelines.</p> <ol style="list-style-type: none"> <li>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.</li> <li>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.</li> </ol> <p><b>Stormwater</b></p> <ol style="list-style-type: none"> <li>6. The site must be managed in order to prevent pollution of drains, downstream watercourses or groundwater, due to suspended solids and silt or chemical pollutants.</li> <li>7. Silt fences should be used to prevent any soil entering the stormwater drains.</li> <li>8. Temporary cut off drains and berms may be required to capture stormwater and promote infiltration.</li> <li>9. Promote a water saving mind set with construction workers in order to Contractor ensure less water wastage.</li> <li>10. Hazardous substances must be stored at least 20m from any water bodies on site to avoid pollution.</li> <li>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.</li> <li>12. Earth, stone and rubble is to be properly disposed of, or utilized on 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.</li> </ol>	
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				<p>13. There should be a periodic checking of the site's drainage system to ensure that the water flow is unobstructed.</p> <p>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.</p> <p><b>Groundwater resource protection</b></p> <p>15. Process solution storage ponds and other impoundments designed to hold non fresh water or non-treated process effluents should be lined and be equipped with sufficient wells to enable monitoring of water levels and quality.</p> <p><b>Sanitation</b></p> <p>16. Adequate sanitary facilities and ablutions must be provided for construction workers (1 toilet per every 15 workers).</p> <p>17. The facilities must be regularly serviced to reduce the risk of surface or groundwater pollution.</p> <p><b>Concrete mixing</b></p> <p>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.</p> <p><b>Public areas</b></p> <p>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.</p> <p>20. The Contractor should take steps to ensure that littering by construction workers does not occur</p>	
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				and persons should be employed on site to collect litter from the site and immediate surroundings, including litter accumulating at fence lines. <b>21. No washing or servicing of vehicles on site.</b>	
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**f) Impact Management Actions**

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

ACTIVITY Whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
<p>(E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.).</p>	<p>(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc....etc...)</p>	<p>(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. etc)</p> <p>E.g.</p> <ul style="list-style-type: none"> <li>• Modify through alternative method.</li> <li>• Control through noise control</li> <li>• Control through management and monitoring</li> </ul> <p>Remedy through rehabilitation..</p>	<p>Describe the time period when the measures in the environmental management programme must be implemented. Measures must be implemented when required.</p> <p>With regard to Rehabilitation specifically this must take place at the earliest opportunity.</p> <p>.With regard to Rehabilitation, therefore state either:-..</p> <p>Upon cessation of the individual activity or.</p> <p>Upon the cessation of mining, bulk sampling or alluvial diamond mining as the case may be.</p>	<p>(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 have been identified by Competent Authorities)</p>
<p>Clearance of vegetation</p>	<p>Loss or fragmentation of habitats</p>	<p><b>Existing vegetation</b></p> <p>30. Vegetation removal must be limited to the mining site.</p> <p>31. Vegetation to be removed as it becomes necessary rather than removal of all vegetation throughout the site in one step.</p> <p>32. No vegetation to be used for firewood.</p> <p>33. Exotic and invasive plant species should not be allowed to establish, if the development is approved.</p> <p><b>Rehabilitation</b></p>	<p>Duration of operation</p>	<p>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.</p>

		<p>34. All damaged areas shall be rehabilitated upon completion of the contract.</p> <p>35. Re-vegetation of the disturbed site is aimed at approximating as near as possible the natural vegetative conditions prevailing prior to construction.</p> <p>36. All natural areas impacted during construction must be rehabilitated with locally indigenous grasses typical of the representative botanical unit.</p> <p>37. Rehabilitation must take place in a phased approach as soon as possible.</p> <p>38. Rehabilitation process must make use of species indigenous to the area. Seeds from surrounding seed banks can be used for re-seeding.</p> <p>39. Rehabilitation must be executed in such a manner that surface run-off will not cause erosion of disturbed areas.</p> <p>40. Planting of indigenous tree species in areas not to be cultivated or built on must be encouraged.</p> <p><b>Demarcation of mining area</b></p> <p>41. All plants not interfering with mining operations shall be left undisturbed clearly marked and indicated on the site plan.</p> <p>42. The mining area must be well demarcated and no construction activities must be allowed outside of this demarcated footprint.</p> <p>43. Vegetation removal must be phased in order to reduce impact of construction.</p> <p>44. Site office and laydown areas must be clearly demarcated and no encroachment must occur beyond demarcated areas.</p> <p>45. Strict and regular auditing of the mining process to ensure containment of the mining and laydown areas.</p>		
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		<p>46. 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.</p> <p><b>Utilisation of resources</b></p> <p>47. Gathering of firewood, fruit, muti plants, or any other natural material onsite or in areas adjacent to the site is prohibited unless with prior approval of the ECO.</p> <p><b>Exotic vegetation</b></p> <p>48. Alien vegetation on the site will need to be controlled.</p> <p>49. 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.</p> <p>50. The spread of exotic species occurring throughout the site should be controlled.</p> <p><b>Herbicides</b></p> <p>51. 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.</p> <p>52. The use of pesticides and herbicides on the site must be discouraged as these impact on important pollinator species of indigenous vegetation.</p> <p><b>Fauna</b></p>		
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		<p>53. Rehabilitation to be undertaken as soon as possible after mining has been completed.</p> <p>54. No trapping or snaring to fauna on the construction site should be allowed.</p> <p>55. No faunal species must be disturbed, trapped, hunted or killed by maintenance staff during any routine maintenance at the development.</p>		
Diamond alluvial & diamond general mine – excavations	Loss of topsoil	<ol style="list-style-type: none"> <li>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.</li> <li>2. Care must be taken not to mix topsoil and subsoil during stripping.</li> <li>3. The topsoil must be conserved on site in and around the pit area.</li> <li>4. Subsoil and overburden in the mining area should be stockpiled separately to be returned for backfilling in the correct soil horizon order.</li> <li>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.</li> <li>6. Stockpiles should be kept clear of weeds and alien vegetation growth by regular weeding.</li> <li>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</li> </ol>	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.

		<p>where contaminated soils are dumped if and when a spillage/leakage occurs should be attained and given to the project manager.</p> <p>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.</p> <ul style="list-style-type: none"> <li>• Record the GPS coordinates of each area.</li> <li>• Record the date of topsoil stripping.</li> <li>• Record the GPS coordinates of where the topsoil is stockpiled.</li> <li>• Record the date of cessation mining activities at the particular site.</li> <li>• Photograph the area on cessation of mining activities.</li> <li>• Record date and depth of re-spreading of topsoil.</li> <li>• Photograph the area on completion of rehabilitation and on an annual basis thereafter to show vegetation establishment and evaluate progress of restoration over time.</li> </ul>		
	Erosion	<ol style="list-style-type: none"> <li>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.</li> <li>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.</li> </ol>	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.

		<ol style="list-style-type: none"> <li>3. Wind screening and stormwater control should be undertaken to prevent soil loss from the site.</li> <li>4. The use of silt fences and sand bags must be implemented in areas that are susceptible to erosion.</li> <li>5. Other erosion control measures that can be implemented are as follows:             <ul style="list-style-type: none"> <li>○ Brush packing with cleared vegetation</li> <li>○ Mulch or chip packing</li> <li>○ Planting of vegetation</li> <li>○ Hydroseeding/hand sowing</li> </ul> </li> <li>6. Sensitive areas need to be identified prior to construction so that the necessary precautions can be implemented.</li> <li>7. All erosion control mechanisms need to be regularly maintained.</li> <li>8. Seeding of topsoil and subsoil stockpiles to prevent wind and water erosion of soil surfaces.</li> <li>9. Retention of vegetation where possible to avoid soil erosion.</li> <li>10. Vegetation clearance should be phased to ensure that the minimum area of soil is exposed to potential erosion at any one time.</li> <li>11. Re-vegetation of disturbed surfaces should occur immediately after construction activities are completed. This should be done through seeding with indigenous grasses.</li> <li>12. No impediment to the natural water flow other than approved erosion control works is permitted.</li> <li>13. 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 be submitted to the Engineer for approval and must include the</li> </ol>		
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		<p>location and design criteria of any temporary stream crossings.</p> <p>14. Stockpiles not used in three (3) months after stripping must be seeded to prevent dust and erosion.</p>		
	Air Pollution	<p><b>Dust control</b></p> <p>14. Wheel washing and damping down of un-surfaced and un-vegetated areas.</p> <p>15. Retention of vegetation where possible will reduce dust travel.</p> <p>16. Clearing activities must only be done during agreed working times and permitting weather conditions to avoid drifting of sand and dust into neighbouring areas.</p> <p>17. Damping down of all exposed soil surfaces with a water bowser or sprinklers when necessary to reduce dust.</p> <p>18. The Contractor shall be responsible for dust control on site to ensure no nuisance is caused to the neighbouring communities.</p> <p>19. A speed limit of 30km/h must not be exceeded on site.</p> <p>20. Any complaints or claims emanating from the lack of dust control shall be attended to immediately by the Contractor.</p> <p>21. Any dirt roads that are utilised by the workers must be regularly maintained to ensure that dust levels are controlled.</p> <p><b>Odour control</b></p> <p>22. Regular servicing of vehicles in order to limit gaseous emissions.</p> <p>23. Regular servicing of onsite toilets to avoid potential odours.</p> <p><b>Rehabilitation</b></p>	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.

		<p>24. The Contractor should commence rehabilitation of exposed soil surfaces as soon as practical after completion of earthworks.</p> <p><b>Fire prevention</b></p> <p>25. 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.</p> <p>26. The Contractor shall have operational fire-fighting equipment available on site at all times. The level of firefighting equipment must be assessed and evaluated through a typical risk assessment process.</p>		
	<p>Noise</p>	<ol style="list-style-type: none"> <li>1. The mining activities must aim to adhere to the relevant noise regulations and limit noise to within standard working hours in order to reduce disturbance of dwellings in close proximity to the development.</li> <li>2. Mine, crushers, workshops and other noisy fixed facilities should be 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 in to the system.</li> <li>3. Truck traffic should be routed away from noise sensitive areas, where possible.</li> <li>4. Noise levels must be kept within acceptable limits.</li> <li>5. Noisy operations should be combined so that they occur where possible at the same time.</li> <li>6. Mine workers to wear necessary ear protection gear.</li> <li>7. Noisy activities to take place during allocated hours.</li> <li>8. Noise from labourers must be controlled.</li> </ol>	<p>Duration of operation</p>	<p>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.</p>

		<ol style="list-style-type: none"> <li>9. Noise suppression measures must be applied to all equipment. Equipment must be kept in good 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.</li> <li>10. The Contractor must take measures to discourage labourers from loitering in the area and causing noise disturbance. Where possible labour shall be transported to and from the site by the Contractor or his Sub-Contractors by the Contractors own transport.</li> <li>11. Implementation of enclosure and cladding of processing plants.</li> <li>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.</li> </ol>		
	<p>Impact on potential cultural and heritage artefacts</p>	<ol style="list-style-type: none"> <li>1. Any finds must be reported to the nearest National Monuments office to comply with the National Heritage Resources Act (Act No 25 of 1999) and to DEA.</li> <li>2. Local museums as well as the South African Heritage Resource Agency (SAHRA) should be informed if any artefacts are uncovered in the affected area.</li> <li>3. The Contractor must ensure that his workforce is aware of the necessity of reporting any possible historical or archaeological finds to the ECO so that appropriate action can be taken.</li> <li>4. Any discovered artefacts shall not be removed under any circumstances. Any destruction of a site can only be allowed once a permit is</li> </ol>	<p>Duration of operation</p>	<p>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.</p>

		<p>obtained and the site has been mapped and noted. Permits shall be obtained from the SAHRA should the proposed site affect any world heritage sites or if any heritage sites are to be destroyed or altered.</p>		
<p>Waste Management</p>		<p><b>Litter management</b></p> <ol style="list-style-type: none"> <li>1. Refuse bins must be placed at strategic positions to ensure that litter does not accumulate within the construction site.</li> <li>2. The Contractor shall supply waste collection bins where such is not available and all solid waste collected shall be disposed of at registered/licensed landfill.</li> <li>3. Good housekeeping practices should be implemented to regularly maintain the litter and rubble situation on the construction site.</li> <li>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.</li> <li>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.</li> <li>6. Skip waste containers should be maintained on site. These should be kept covered and arrangements made for them to be collected regularly.</li> <li>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.</li> <li>8. Where a registered waste site is not available close to the construction site, the Contractor</li> </ol>	<p>Duration of operation</p>	<p>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.</p>

		<p>shall provide a method statement with regard to waste management.</p> <ol style="list-style-type: none"> <li>9. A certificate of disposal shall be obtained by the Contractor and kept on file, if relevant.</li> <li>10. Under no circumstances may solid waste be burnt on site.</li> <li>11. All waste must be removed promptly to ensure that it does not attract vermin or produce odours.</li> </ol> <p><b>Hazardous waste</b></p> <ol style="list-style-type: none"> <li>12. All waste 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.</li> <li>13. Contaminants to be stored safely to avoid spillage.</li> <li>14. Machinery must be properly maintained to keep oil leaks in check.</li> <li>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.</li> </ol> <p><b>Sanitation</b></p> <ol style="list-style-type: none"> <li>16. The Contractor shall install mobile chemical toilets on the site.</li> <li>17. Staff shall be sensitised to the fact that they should use these facilities at all times. No indiscriminate sanitary activities on site shall be allowed.</li> <li>18. Toilets shall be serviced regularly and the ECO shall inspect toilets regularly.</li> <li>19. Toilets should be no closer than 50m or above the 1:100 year flood line from any natural or</li> </ol>		
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		<p>manmade water bodies or drainage lines or alternatively located in a place approved of by the Engineer.</p> <p>20. Under no circumstances may open areas, neighbours fences or the surrounding bush be used as a toilet facility.</p> <p>21. The construction of “Long Drop” toilets is forbidden, but rather toilets connected to the sewage treatment plant.</p> <p>22. Potable water must be provided for all construction staff.</p> <p><b>Remedial actions</b></p> <p>23. Depending on the nature and extent of the spill, contaminated soil must be either excavated or treated on-site.</p> <p>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.</p> <p>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.</p> <p>26. If a spill occurs on an impermeable surface such as cement or concrete, the surface spill must be contained using oil absorbent material.</p> <p>27. If necessary, oil absorbent sheets or pads must be attached to leaky machinery or infrastructure.</p> <p>28. Materials used for the remediation of petrochemical spills must be used according to product specifications and guidance for use.</p> <p>29. Contaminated remediation materials must be carefully removed from the area of the spill so</p>		
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		as to prevent further release of petrochemicals to the environment, and stored in adequate containers until appropriate disposal.		
Water Use and Quality	Water pollution	<p><b>Water Use</b></p> <ol style="list-style-type: none"> <li>1. Develop a sustainable water supply management plan to minimise the impact to natural systems by managing water use, avoiding depletion of aquifers and minimising impacts to water users.</li> <li>2. Water must be reused, recycled or treated where possible.</li> </ol> <p><b>Water Quality</b></p> <ol style="list-style-type: none"> <li>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.</li> <li>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.</li> <li>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.</li> </ol> <p><b>Stormwater</b></p> <ol style="list-style-type: none"> <li>6. The site must be managed in order to prevent pollution of drains, downstream watercourses or groundwater, due to suspended solids and silt or chemical pollutants.</li> <li>7. Silt fences should be used to prevent any soil entering the stormwater drains.</li> <li>8. Temporary cut off drains and berms may be required to capture stormwater and promote infiltration.</li> </ol>		

		<p>9. Promote a water saving mind set with construction workers in order to Contractor ensure less water wastage.</p> <p>10. New stormwater construction must be developed strictly according to specifications from engineers in order to ensure efficiency.</p> <p>11. Hazardous substances must be stored at least 20m from any water bodies on site to avoid pollution.</p> <p>12. 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.</p> <p>13. Earth, stone and rubble is to be properly disposed of, or utilized on 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.</p> <p>14. There should be a periodic checking of the site's drainage system to ensure that the water flow is unobstructed.</p> <p>15. 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.</p> <p><b>Groundwater resource protection</b></p> <p>16. Process solution storage ponds and other impoundments designed to hold non fresh water or un-treated process effluents should be lined and be equipped with sufficient wells to enable monitoring of water levels and quality.</p> <p><b>Sanitation</b></p>		
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		<p>17. Adequate sanitary facilities and ablutions must be provided for construction workers (1 toilet per every 15 workers).</p> <p>18. The facilities must be regularly serviced to reduce the risk of surface or groundwater pollution.</p> <p><b>Concrete mixing</b></p> <p>19. 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.</p> <p><b>Public areas</b></p> <p>20. 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.</p> <p>21. 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.</p> <p>22. No washing or servicing of vehicles on site.</p>		
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- i) **Financial Provision**
- (1) **Determination of the amount of Financial Provision.**
- (a) **Describe the closure objectives and the extent to which they have been aligned to the baseline environment described under the Regulation.**
  - Final landforms must be resilient to perturbation and also be self-sustaining to obviate/limit further/ongoing interventions and maintenance by Veronica Dineo Ntsekeletsa.
  - The remaining impacts be of an acceptable nature with minimal deterioration over time.
  - The final outcome of the mine site rehabilitation would be productive systems, where required sustaining either cattle or wildlife.
  - Environmental and human quality of life, including health and safety requirements in general, would not be compromised; and
  - Closure is achieved in an efficient and cost-effective manner as possible and with minimum socioeconomic changes.

The above goal is underpinned by more specific objectives listed below.

**1. Upfront planning/development**

To provide overall guidance and direction to closure planning and/or the implementation of progressive closure measures over the remaining over the operational life of the mine.

**2. Physical stability**

To ensure that surface infrastructure and mining residue and/or disturbances that are present at mine 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.

- Closure, removal and disposal of all surface infrastructure that has no beneficial post-closure use.
- Shaping and vegetating the remaining earth embankments, trenches, etc. to stabilise slopes and integrate with surrounding topography.

**3. Environmental quality**

To ensure that local environmental quality is not adversely affected by possible physical effects arising from mine operations and the mine site after closure. This will be achieved by:

- Avoiding and/or limiting the following during mining operations which could result in adverse effects that could not be readily addressed and/or mitigated at mine closure.
  - Dust fall-out areas surrounding the mine site.
  - Wash-off and/or mobilisation of chemically contaminated soils and sediments from the mine site that could have long term adverse effects on local aquatic health and/or other water uses.
  - Possible shallow groundwater contamination adversely affecting the quality of the local water resource and its beneficial use.
- Limiting the potential for dust generation on the rehabilitated mine site that could cause nuisance and/or health effects to surrounding landowners;
- Limiting the possible adverse water quality and quantity effects arising from the rehabilitated mine site to ensure that long term beneficial use of local resources is not compromised;
- Conducting soil clean-up/remediation to ensure that the planned land use could be implemented and maintained;

**4. Health and safety**

To limit the possible health and safety treats due to terrain hazards to humans and animals utilizing the rehabilitated mine site after mine closure by:

- Demonstrating through upfront soil testing that any resultant inorganic and organic pollution present on the site is acceptable;

- Removal of potential contaminants such as hydrocarbons and chemicals off site;
- Shaping of embankments and trenches to safe slopes and reintegrating of these into surrounding topography.
- Ensuring that the environmental quality as reflected above is achieved.

#### **5. Land capability / land use**

To ensure that the required land capability to achieve and support the planned land use can be achieved over the mine site by:

- Clean-up and reclamation of contaminated soil areas in order not to compromise the above land use planning earmarked for implementation;
- To ensure that the overall rehabilitated mine site is free draining
- Transferring mining related surface infrastructure to third parties for beneficial use after mine closure.

#### **6. Aesthetic quality**

To ensure that the rehabilitated mine site will display, at a minimum, an acceptable aesthetic appearance that would not compromise the planned land use by leaving behind:

- A mining area that is properly cleared-up with no fugitive/scattered waste piles
- Rehabilitated mining area that is free draining and disturbed areas that are suitably vegetated.
- Rehabilitated mining residues that are suitably landscaped, blending with the surrounding environment as far as possible.
- Shaped and rehabilitated terrace and hard stand areas, roughly emulating the local natural surface topography.

#### **7. Landscape viability**

To create a landscape that is self-sustaining and over time will evolve/converge to the desired ecosystem structure, function and composition by:

- Conducting surface profiling, with associated material movement optimisation, to obtain a landscape resembling the natural landscapes to support the succession trajectory towards a climax ecological system.
- Establishing woody patches and create “rough and loose” areas for pioneer specie establishment around the respective patches.
- Establishing pioneer species as follows:
  - Collected and prepared seeds for broad casting;
  - Seedlings grown on on-site nursery;
  - Cuttings collected from surrounding veld areas;
  - Conducting rehabilitation monitoring and corrective action as required.

#### **8. Biodiversity**

To encourage, where appropriate, the re-establishment of native vegetation on the rehabilitated mine site such the terrestrial biodiversity is largely re-instated over time, by:

- Stabilising disturbed areas to prevent erosion in the short- to medium term until a suitable vegetation cover has established; and
- Establishing viable self-sustaining vegetation communities of local fauna, as far as possible.

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

Closure objectives within the EMP have been presented to the public as part of the public participation process and on-going closure planning for mining.

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

The Rehabilitation Plan is attached as **Appendix 8**.

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

The rehabilitation plan relates to each closure objective identified for the mine. Therefore, the rehabilitation plan is considered to be compatible with the closure objectives.

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

**Still to be calculated**

Mining will be restricted to the 4.9 Ha applied for. For every 0.98 Ha there will be no more than 10 trenches at any given time, which will be dug.

$$\frac{4.9 \text{ hectern}}{50 \text{ trenches}} = 0.098 \text{ Ha per trench}$$

- Ha- (40m x 24.5m) trench = 10 trenches every hectare. The total area to be disturbed at any given time will be- 4 trenches x (40m x 24.5m) = 0.392 Ha at any given time
- No more than 0.392 Ha (4 Trenches) will be left as un-rehabilitated. Rehabilitation will be done concurrently.

Rehabilitation will be taking place continuously and therefore only a small area (0.392 Ha) will be left un-rehabilitated at the end of mining activities, which will require the amount provided in the quantum.

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

**Financial Guarantee**

The financial guarantee for the rehabilitation for land disturbed by Veronica Dineo Ntsekeletsa was submitted together with the application for the mining permit.

**Rehabilitation Fund**

Veronica Dineo Ntsekeletsa will also make provision for rehabilitation during closure by establishing a rehabilitation trust.

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

- g) **Monitoring of Impact Management Actions**
- h) **Monitoring and reporting frequency**
- i) **Responsible persons**
- j) **Time period for implementing impact management actions**
- k) **Mechanism for monitoring compliance**

<b>SOURCE ACTIVITY</b>	<b>IMPACTS REQUIRING MONITORING PROGRAMMES</b>	<b>FUNCTIONAL REQUIREMENTS FOR MONITORING</b>	<b>ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)</b>	<b>MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS</b>
Clearance of vegetation	Loss or fragmentation of habitats	<ul style="list-style-type: none"> <li>• Conduct regular internal audits</li> <li>• Conduct regular external audits</li> </ul>	<ul style="list-style-type: none"> <li>• Environmental Manager</li> <li>• Suitable qualified environmental auditor</li> </ul>	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.
Diamond alluvial & diamond general mine – excavations	Loss of topsoil Erosion Air Pollution Noise Impact on potential cultural and heritage artefacts	<ul style="list-style-type: none"> <li>• Conduct regular internal audits</li> <li>• Conduct regular external audits</li> </ul>	<ul style="list-style-type: none"> <li>• Environmental Manager</li> <li>• Suitable qualified environmental auditor</li> </ul>	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.
Waste management	Pollution	<ul style="list-style-type: none"> <li>• Conduct regular internal audits</li> <li>• Conduct regular external audits</li> </ul>	<ul style="list-style-type: none"> <li>• Environmental Manager</li> <li>• Suitable qualified environmental auditor</li> </ul>	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	<ul style="list-style-type: none"> <li>• Conduct regular internal audits</li> <li>• Conduct regular external audits</li> </ul>	<ul style="list-style-type: none"> <li>• Environmental Manager</li> <li>• Suitable qualified environmental auditor</li> </ul>	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.

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

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**

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

Veronica Dineo Ntsekeletsa 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;
- In-house training sessions to be held with relevant employees;
- On the job training regarding environmental issues
- Training and skills development

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

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

Veronica Dineo Ntsekeletsa will implement an incident reporting and reporting procedure in order to identify risks timeously and implement actions to avoid or minimise environmental impacts.

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

No specific information requirements have been detailed by the Competent Authority.



## 2) UNDERTAKING

The EAP herewith confirms

- f) the correctness of the information provided in the reports
- g) the inclusion of comments and inputs from stakeholders and I&APs ;
- h) the inclusion of inputs and recommendations from the specialist reports where relevant; and
- i) that the information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties are correctly reflected herein.



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Signature of the environmental assessment practitioner:

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Milnex 189 CC – Environmental Consultants

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Name of company:

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09 – 06 – 2017

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Date:

**-END-**