APPENDIX 14

SOIL STUDY (2013)

SOIL, LAND USE AND LAND CAPABILITY BASELINE ASSESSMENT FOR A FEASIBILITY STUDY FOR THE PROPOSED VENTERSBURG MINE

GOLD ONE AFRICA LIMITED

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Report Title: **SOIL, LAND USE AND LAND CAPABILITY BASELINE ASSESSMENT FOR A FEASIBILITY STUDY FOR THE PROPOSED VENTERSBURG MINE**

Project Number: **GOL1675**

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EXECUTIVE SUMMARY

Gold One Africa Limited (Gold One) has recently completed a Pre-Feasibility Study for a potential new underground gold mine and plant at the proposed Ventersburg Mine project area located in the Free State Province of South Africa. Digby Wells Environmental has been appointed by to conduct a soil survey baseline assessment as part of a bankable feasibility study for the project.

A variety of soil types were identified for the project area. The soils can be grouped into two groups namely heavy clay soils occupying areas dominated by grazing and sandy yellow soils occupying areas dominated by arable agriculture. Examples are heavy Valsrivier and yellow sandy Avalon, Clovelly and Westleigh soils respectively.

The land capability of the proposed Ventersburg Mine can be classified as mixed arable and grazing. The agricultural potential of deep yellow soil is high while the agricultural potential of heavy clay soil is low.

Underground mining will not impact directly on the land capability although the above ground infrastructure will decrease land capability therefore changing the land use from agriculture to industrial. It is recommended that removable mining infrastructure is demolished post mining and that the land be rehabilitated back to pre-mining land capability. Permanent features such as dumps need a sustainable vegetated soil cover to control water runoff and infiltration to prevent potential soil erosion and groundwater pollution.

It is recommended that TSF 2 site is used in order to minimise the permanent removal of high potential arable cultivated land from production. The soil in the grazing area depicted in Plan 2 is represented by low agricultural potential Valsrivier soil form. This soil is characterised by a high clay content and low water permeability and cannot be cultivated easily.

LIST OF ABBREVIATIONS

Gold One	Gold One Africa Limited
Digby Wells Environmental	Digby Wells Environmental
PFS	Pre-Feasibility Study
BFS	Bankable Feasibility Study
TSF	Tailings Storage Facility
NEMA	National Environmental Management Act
ECA	Environmental Conservation Act
MPRDA	Mineral and Petroleum Resources Development Act
CARA	Conservation of Agricultural Resources Act
NWA	National Water Act
ISCW	Institute for Soil Climate and Water
ARC	Agricultural Research Council
GPS	Global Positioning System
AGIS	Agricultural Information System for South Africa
Av	Avalon soil form
Cv	Clovelly soil form
We	Westleigh soil form
Va	Valsrivier soil form
C	Carbon
CEC	Cation Exchange Capacity

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1 INTRODUCTION

Gold One has recently completed a Pre-Feasibility Study (PFS) for a potential new gold mine and plant for the proposed Ventersburg Mine area located in the Free State Province of South Africa. Digby Wells Environmental (Digby Wells) has been appointed to undertake various specialist studies as part of the Bankable Feasibility Study (BFS). The proposed project will involve underground mining, including a shaft, a rock dump, a processing plant, and Tailings Storage Facility (TSF).

The Soil baseline assessment is one of the several baseline assessment studies and was conducted in order to determine the available soil types associated with the study area. In addition to this, the current land uses and land capabilities have also been assessed and described.

1.1 South African Legislation Pertaining to Soil

The following section outlines a summary of the most recent South African Environmental Legislation that needs to be considered with reference to the management of soil:

- Section 24 of the Constitution of the Republic of South Africa contains the environmental right of South Africa's citizens. Section 24(a) afforded every person with the entitlement to enjoy a right to an environment which is not harmful to their health and well-being, whilst section 24(b) impose a positive duty on the state to protect the environment through reasonable legislative and other measures that prevent pollution and ecological degradation; promote conservation; and secure ecological sustainable development and the use of natural resources while promoting justifiable economic and social development.
- Soils and land capability are protected under the National Environmental Management Act, 1998 (Act 108 of 1998) (NEMA), the Environmental Conservation Act, 1989 (Act 73 of 1989) (ECA), the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) (MPRDA) , the Conservation of Agricultural Resources Act (Act 43 of 1983) (CARA) and the National Water Act, 1998 (Act 36 of 1998) (NWA);
- The NEMA gives effect to the environmental right in the Constitution. Some of the principles contained in section 2 of NEMA are applicable to soil conservation and must be taken into account by organs of states and their decision-making. The sustainable development principles in NEMA require the consideration of all relevant factors, including that the disturbance of ecosystems. The NEMA also requires that pollution and degradation of the environment be avoided or where it cannot be avoided, minimized and remedied;
- The ECA is applicable to soil through the prevention of pollution through the removal of litter, incorporation of waste management activities and control of activities that may have a detrimental effect on the environment such as:

- Land use and transformation;
- Resource removal;
- Agricultural processes;
- Industrial processes such as mining;
- Transportation;
- Waste and sewage disposal; and
- Chemical treatment.

- The MPRDA provides a good framework for addressing rehabilitation. The MPRDA requires that a holder of a prospecting right or mining right must rehabilitate the area affected by prospecting or mining operations to its natural or predetermined state or to a land use which conforms to the generally accepted principle of sustainable development;
- The CARA provides for the conservation of the natural agricultural resources of the Republic by the maintenance of the production potential of land, by the combating and prevention of erosion and weakening or destruction of the water sources, and by the protection of the vegetation and the combating of weeds and invader plants.
  - In order to achieve the objects of this Act the Minister may prescribe control measures which shall be complied with by land users to whom they apply. Such measures may relate to -
    - Cultivation of virgin soil;
    - Utilization and protection of land which is cultivated;
    - Irrigation of land;
    - Prevention or control of waterlogging or salination of land;
    - Utilization and protection of wetlands, marshes, water sponges, water courses and water sources;
    - Regulating of the flow pattern of run-off water;
    - Utilization and protection of the vegetation;
    - The grazing capacity of veld, expressed as an area of veld per large stock unit;
    - The maximum number and the kind of animals which may be kept on veld;
    - The prevention and control of veld fires;
    - The utilization and protection of veld which has burned;
    - The control of weeds and invader plants;
    - The restoration or reclamation of eroded land or land which is otherwise disturbed or denuded;
    - The protection of water sources against pollution on account of farming practices;

- The construction, maintenance, alteration or removal of soil conservation works or other structures on land; and
- Any other matter which the Minister may deem necessary or expedient in order that the objects of this Act may be achieved, and the generality of this provision shall not be limited.

- In view of the close relationship between water conservation and soil conservation, provisions of the NWA aimed at water conservation are also of central importance to soil-conservation.

2 TERMS OF REFERENCE

Digby Wells has been tasked with the following:

- A field survey to establish broad soil patterns, land use and land capability at the proposed underground mine and plant site; and
- Compilation of a soil report on the survey findings and recommendations.

3 METHODOLOGY

The reconnaissance survey of the soils occupying the area was conducted in October 2012 during field visits. The project site has been traversed by vehicle and on foot. A hand soil auger was used to survey the soil types present as well as to obtain soil samples.

Land type generalised soil background data for the site was obtained from the Institute for Soil Climate and Water (ISCW) of the Agricultural Research Council (ARC). The land type data is presented at a scale of 1:250 000 and delineates land into land types, see Plan 1.

The soil forms (types of soil) found in the landscape was identified using the South African soil classification system namely; Soil Classification: A Taxonomic System for South Africa (Soil Classification working group, 1991).

Soils, both top (0 – 300 mm) and sub-soils (300 – 600 mm) were sampled from dominating soil forms during the field visit. The soil samples were analysed for physical and chemical properties as follows:

- pH (water);
- Extractable cations and Na, K, Ca, Mg (Ammonium Acetate);
- Cation Exchange Capacity;
- Carbon content;
- Phosphorus (Bray1) soil texture namely sand, silt and clay were also determined; and
- Soil texture namely sand, silt and clay were also determined.

Soil samples were analysed by the Agricultural Research Council laboratory at ISCW (Inst. Soil Climate & Water. Pretoria), using standard acceptable methods as described by The

Non-Affiliated Soil Analysis Work Committee (1990) for pH (H_2O), CEC (cation exchange capacity and extractable cations – Ammonium Acetate Method), particle size distribution (3 - Fraction – Pipette Method) and P (phosphorus extraction - Bray No.1).

Land capability depends on soil capability which was determined at soil survey positions including additional observations during the site visits. The present land use was in addition also recorded.

3.1 Soil Survey

The soils in this area are fairly homogeneous in nature and follow the natural topography of the area. The soils are grouped into yellow sandy soil consisting of Avalon, Clovelly and Westleigh soil. This group is represented by the arable class and is found on the mid slopes, see Plan 2. Heavy darker clay textured soil for example the Valsrivier soil is represented by the grazing class in Plan 2. These soils and their distribution are depicted in Plan 3 and are found on the upper steeper slopes of the project area. The Western part of the Project area could not be surveyed due to limited; however the soil form boundaries follow the Land type and land capability boundaries closely. There is also a good indication of soils forms and capabilities from the current land use.

A hand soil auger was used to determine the soil type and depth. The soils were augered to the first restricting layer or 1.5 m depth. The soil forms (types of soil) found in the landscape were identified using the South African soil classification system namely; Soil Classification: A Taxonomic System for South Africa (Soil Classification working group, 1991).

Land use and land capability were determined at soil survey positions. Survey positions were recorded as waypoints using a handheld Global Positioning System (GPS). Other features like existing open trenches were also helpful to determine the soil type and depth.

3.2 Soil Sampling

The topsoil (0-300 mm) and subsoil (300 – 600) of major soil groups were sampled. Samples have been analysed at the Agricultural Research Council, Institute for Soil Climate and Water soil laboratory for soil acidity, fertility and textural indicators. Samples were analysed for soil acidity, fertility and textural indicators as follows:

The topsoil (0-300 mm) and subsoil (300 – 600) of the dominant soil forms were sampled.

- pH (water);
- Extractable cations and Na, K, Ca, Mg (Ammonium Acetate);
- Cation exchange capacity;
- Carbon content;
- Phosphorus (Bray1); and
- Soil texture will be determined namely sand, silt and clay.

4 SOIL SURVEY FINDINGS

The proposed Ventersburg Mine is located predominantly on farm land. The available land types and soil observation points for the study are presented in Plan 1. The area is relatively flat as indicated in Figure 4-1. The project site is dominated by two Land types as presented in Plan 1 (Appendix A). The land use is agriculture, arable and grazing, but dominated by arable agriculture as shown in Plan 2. The land use division is based on the dominating soil types present in the landscape.

According to the land type data the expected soils for the project area can be represented by the dominating land types Bc 30 and Dc 12 although smaller areas of the project site are situated within the EA 40 and DC 8 Land Types. These Land Types are represented on the 2726 Kroonstad and 2826 Windburg Land Type maps (Land Type Survey Staff, 1989). The underlying geology consist mainly of sandstone, siltstone and shale, see Plan 1.

Figure 4-1: The depicted landscape present at the Proposed Ventersburg Mine is flat

4.1 Dominant Soil Forms Contained in Land Type Bc30

A large area of the Bc land type is used for arable agriculture due to the arable soil capability present in this land type. The Bc land type contains crest, mid slope, foot slope and valley bottom landscape positions (Agricultural Information System for South Africa (AGIS), accessed at www.agis.agric.za on November 15, 2012). The crest landscape position is dominated by shallow soils, rock and red soils. Respectively the soil types present in the landscape are Mispah and Hutton soils. The soils are non-structured and the A horizon contains 6 – 12% clay. Soil texture represents a sandy loamy textured soil.

The mid slope position is dominated by Bainsvlei and Hutton soils while the foot slope position is dominated by Bainsvlei, Hutton, Avalon and Westleigh soil types. The valley bottom position is occupied by heavy clay structured soils such as Valsrivier, Sterkspruit and Katspruit soils. Below contained in Figure 4-2: is an example of an arable yellow Avalon soil form.

Figure 4-2: Large areas of the Proposed Ventersburg Mine are occupied by yellow arable Avalon and Westleigh soils

The soils that were found in the Bc30 land type portion of the project area, see Plan 3 are described below:

The Avalon soil form (Av) consists of an Orthic A horizon, a Yellow brown apedal B horizon, and a soft Plinthic C horizon. The A and B horizon have good internal drainage properties, therefor water can move freely through them. However the Plinthic C shows

signs of mottling and localization of iron and manganese concretions as a result of a fluctuating water table. Anaerobic conditions occur in this zone and iron and manganese reduce and then later when the water table drops oxidizes into localized concretions.

These soils are highly sought after for dry land crop production as they can produce good crop yields due to the ability of the A and B horizons to drain freely and the ability of the Plinthic horizon to store water in the lower part of the profile where the water can then be tapped at a later stage during the growing season by the roots. A typical Avalon soil profile (SASA, 1999) is presented in Figure 4-3.

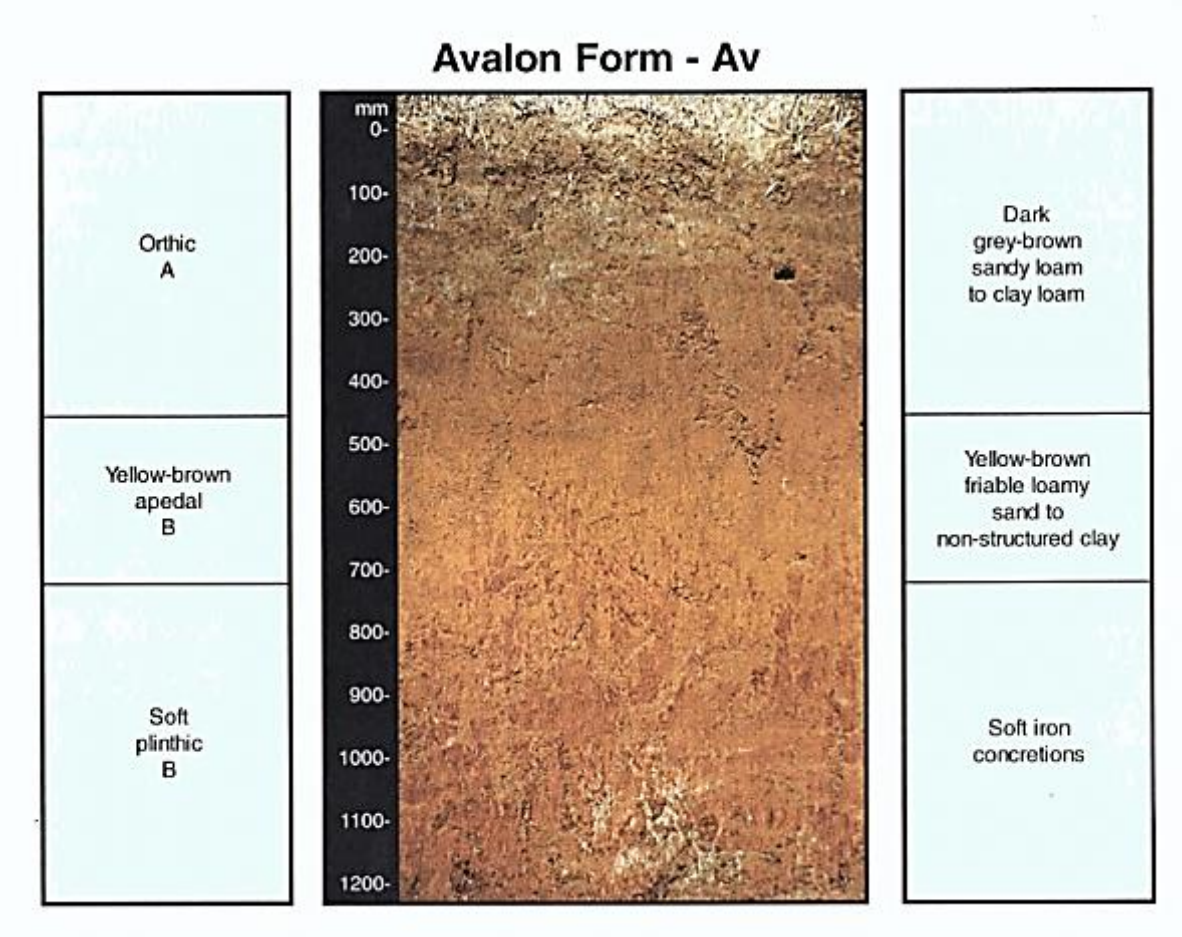

Figure 4-3: Typical soil profile for the Avalon soil forms (SASA, 1999)

The Clovelly soil form (Cv) consists of an Orthic A horizon, and a Yellow brown apedal B horizon. The A and B horizon have good internal drainage properties, therefor water can move freely through them. These soils are generally slightly drier then the Avalon as it has no limiting layer to hold or contain moisture. These are good agricultural soils as they are easy to manage. A typical Clovelly soil profile is shown in Figure 4-4.

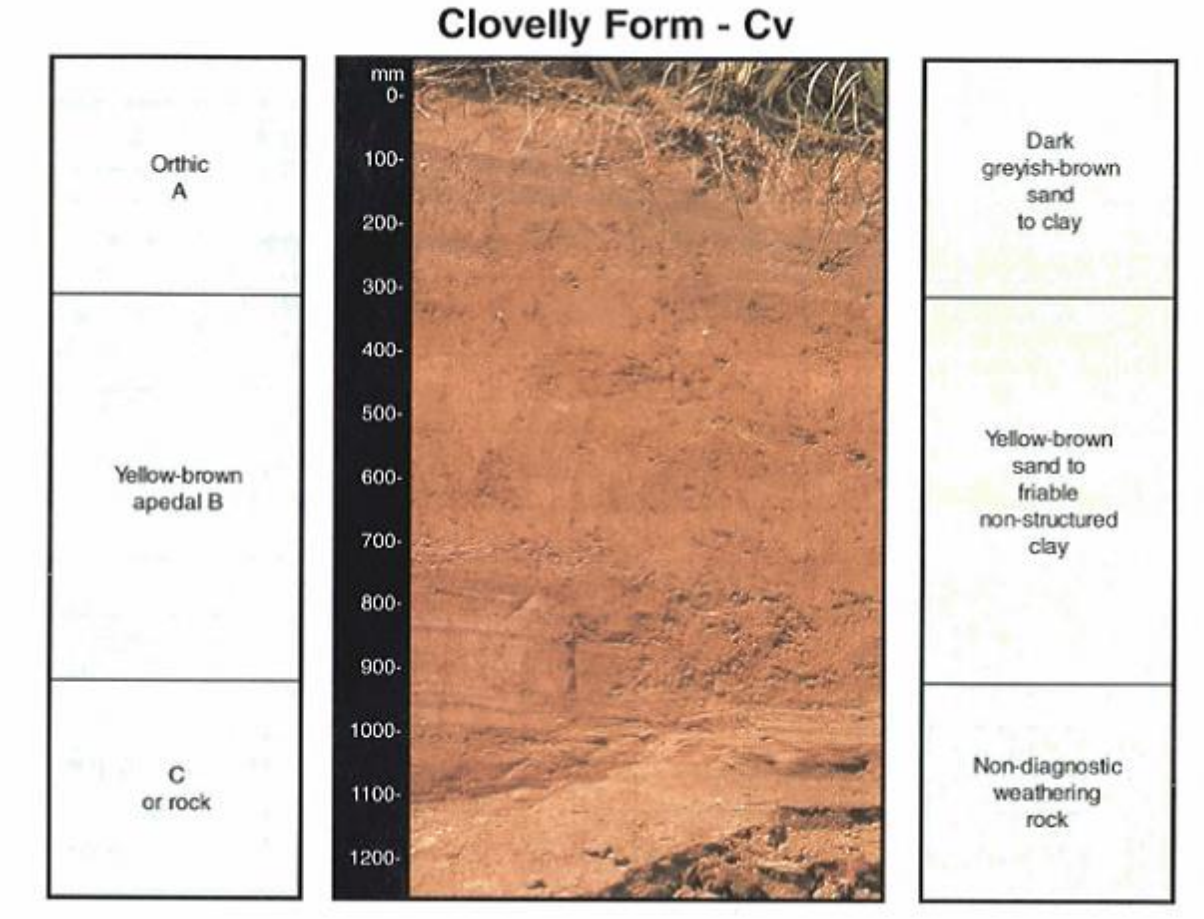

Figure 4-4: Typical deep yellow sandy Clovelly profile

The Westleigh Soil Form (We) soil form is a soil that displays signs of a fluctuating water table. The B horizon is classified as soft Plinthic which shows signs of mottling and localization of iron and manganese concretions. These soils are good soils in dry land conditions as they have the ability to store water in the Plinthite layer, however under irrigation these soils have to be managed very well, because of their tendency to cause waterlogged conditions. Under irrigation it is recommended to fill the soil profile before planting and then allowing the maize to get to about the 6 leaf stage. short irrigation cycles with a limited amount of water is required, reasons being that if a large rain event occurs, waterlogged conditions may occur and a loss of yield could occur. A typical Westleigh soil profile (SASA, 1999) is presented in Figure 4-5.

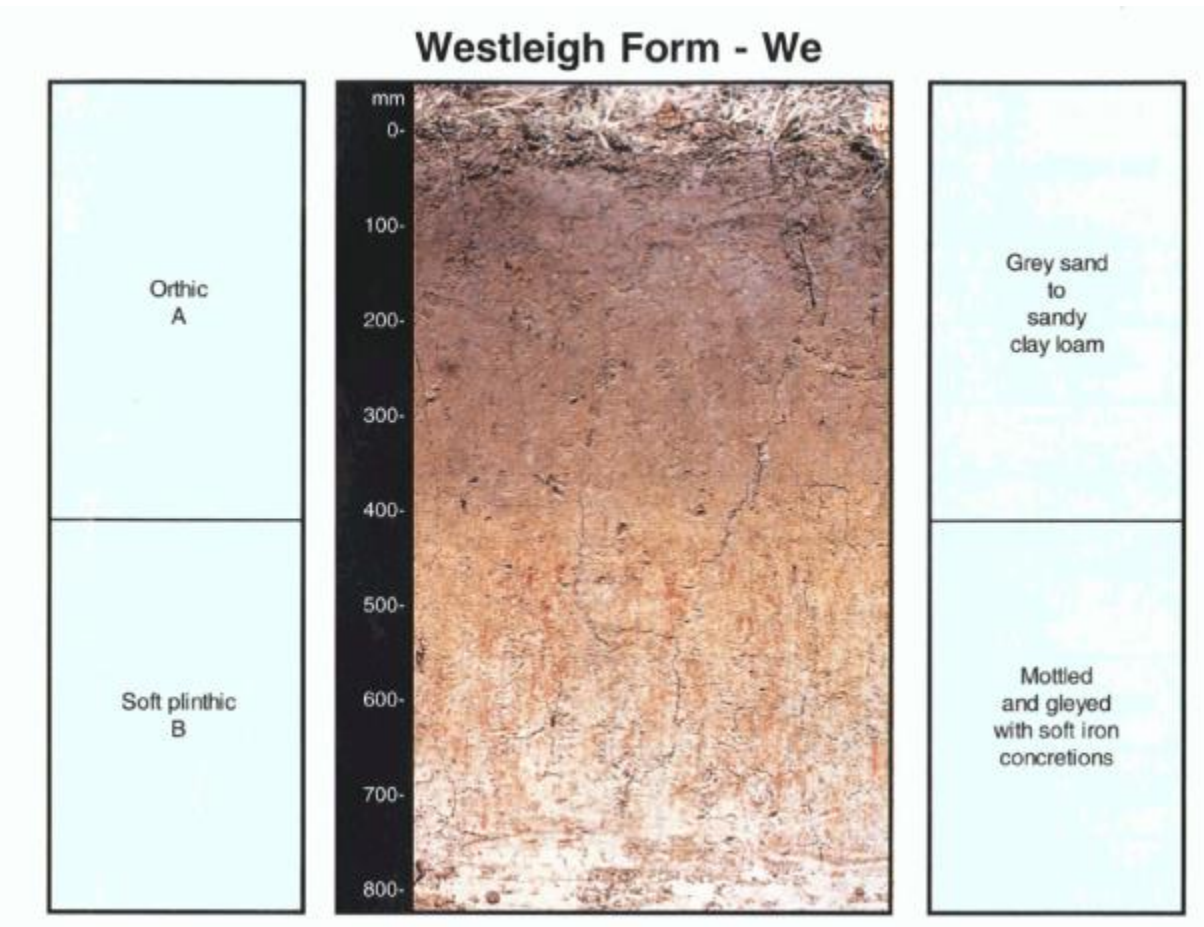

Figure 4-5: Typical soil profile of the Westleigh soil form (SASA, 1999)

4.2 Dominant Soil Form Contained in Land Type Dc 12

The Dc 12 land type is used mainly for grazing because the soil capability of the dominating soil types is grazing. The Dc 12 land type contains crest, scarp, mid slope, foot slope and valley bottom positions. The crest, scarp and mid slope and foot slope positions are dominated by shallow rocky soil such as Mispah soil, rocks, shallow structured red soil, such as Valsrivier soil, dark coloured structured soil, such as Milkwood soil while the valley bottom positions are occupied by deeper heavy clay soils.

Appendix A, Plan 2 contains the dominant land use areas. The dominant soil type occupying the grazed area within land type Dc 12 is heavy structured soil such as is represented by the Valsrivier soil form. Land type Bc 30 is occupied by arable sandy soil such as Avalon, Clovelley and Westleigh soils.

The soils that were found in the Dc12 land type portion of the project area are described below:

The Valsrivier Soil Form (Va) consists of an Orthic A, Pedocutanic B, on unconsolidated material without signs of wetness. These soils have a strongly structured B horizon which

impede root and water penetration (Fey, 2010), therefor the effective crop rooting depth is generally limited to the A horizon. These soils are also highly erodible due to the dispersive nature of the B horizons. Once the A horizon has been penetrated by erosion the subsoil will erode rapidly and large gullies can be formed.

These soils are generally used for grazing, however this needs to be managed well so that overgrazing is prevented, due to the high erosion hazard that this soil presents. A typical Valsrivier soil profile is presented in Figure 4-6.

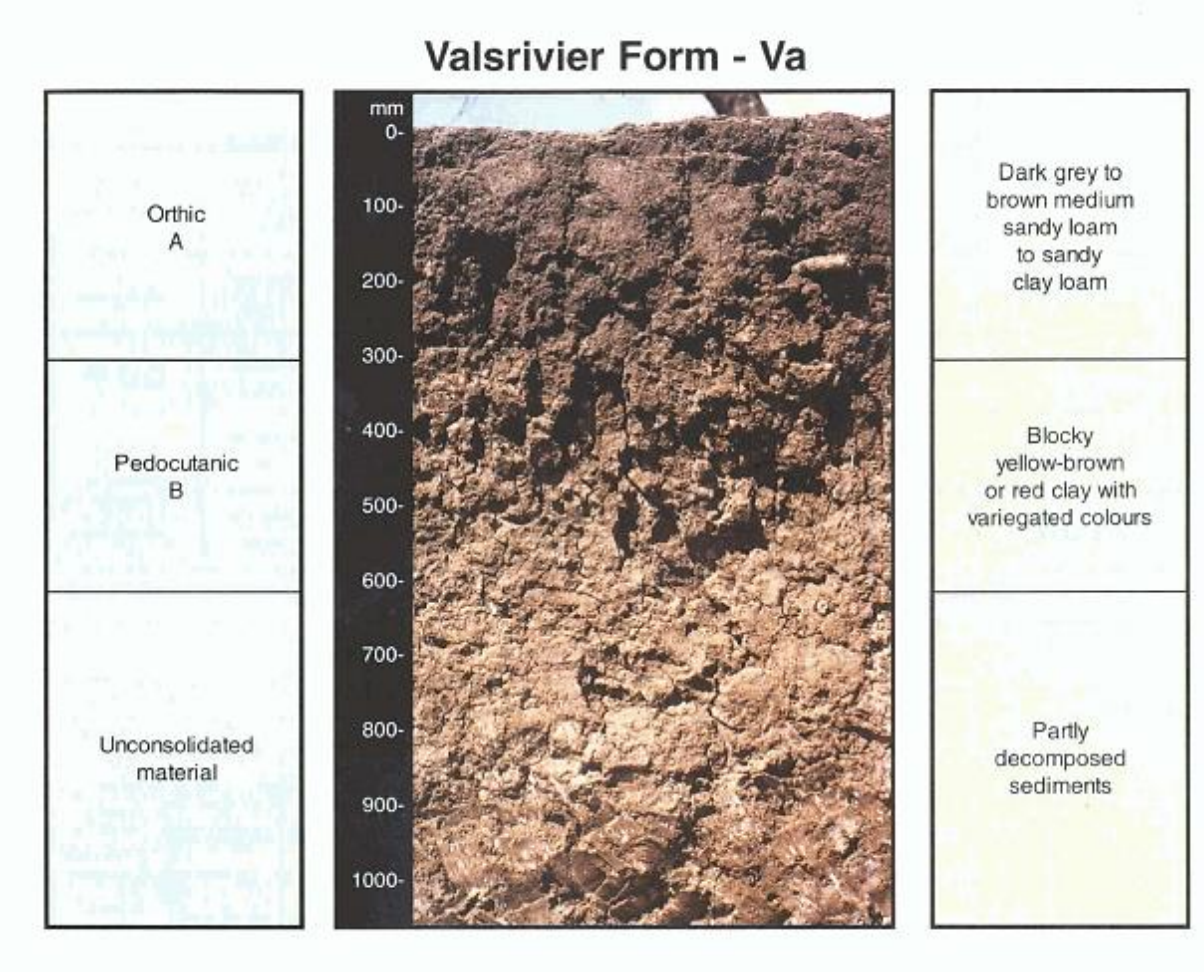

Figure 4-6: Shows a typical soil profile for the Valsrivier soil form (SASA, 1999)

4.3 Soil Fertility

Soil fertility, in its simplest definition, is the ability of the soil to make plant nutrients available to the plant (The Fertilizer Society of South Africa, 2007).

Soil fertility is determined by the following factors:

- The available as well as the reserve plant nutrients within the soil.
- Factors that influence nutrient availability such as pH, clay content, organic matter, aeration, soil moisture, micro-organisms and soil temperature.

Table 4-1 contains the analytical data of the major soil types found at the proposed Ventersburg Mine. The heavier textured soils were all sampled within the grazed areas as indicated in Figure 4-1 while the more sandy textured soil were all sampled from the arable cultivated lands.

Table 4-1: Soil laboratory results, chemical and physical analytical data

Sample Point	Soil	Org C %	CEC $cmol^{+}$ kg^{-1}	K mg kg^{-1}	Ca mg kg^{-1}	Mg mg kg^{-1}	Na mg kg^{-1}	P (Bray1) mg kg^{-1}	pH (H_2O)	Sand %	Silt %	Clay %
1	Top	1.09	12.1	265	877	356	7.9	28.2	6.05	72	8	20
2	Sub			327	1408	786	19.5	20.1	6.12			
3	Top	0.41	10.5	206	519	201	3.4	32.8	6.63	78	4	18
4	Sub			346	1325	815	14.5	29.1	6.23			
5	Top	0.5	18.3	217	1309	617	17.3	23.3	5.67	60	6	34
6	Sub			267	1288	567	10.9	11.7	6.02			
7	Top	0.29	6.5	252	574	138	1.5	24.3	6.04	82	2	16
8	Top	0.27	4.6	341	377	89	0.22	23.9	6.44	84	2	14
9	Sub			205	761	313	0.31	12.2	6.5			
10	Top	0.15	5.9	117	288	58	1.1	17.1	6.39	86	2	12
11	Sub			124	529	276	0.23	10.2	6.02			
12	Top	0.17	4.5	153	308	49	0.87	26.3	5.78	88	2	10
13	Sub			179	1131	219	1.8	17.2	6.44			

The uncultivated clayey topsoil contains higher Carbon (C) content than the cultivated sandy counterparts, 1.09, 0.41 and 0.5 % compared to 0.2 – 0.3 %. C is mineralised by cultivation and it is expected that the uncultivated topsoil content is lower than the cultivated topsoil C content.

The clayey uncultivated soils have higher cation exchange capacity (CEC) than the cultivated sandy red soils in the project area. A low CEC reflects low soil clay and organic matter content, because CEC is a property of both clay and organic material. A low CEC also reflects the type of clay mineral present in the soil matrix. Low CEC is associated with mainly kaolinitic silicate clay minerals which are generally considered as low activity clays. Low activity and CEC also imply a low natural fertility status because lower concentrations of nutrients can potentially be adsorbed by the soil matrix.

Many of South Africa's good soils have a CEC of between 5 and 20 $cmol_c\ kg^{-1.}$ (The Fertilizer Society of South Africa, 2007). From the soils analysis above we can see that the clayey soils, for example the Valsrivier soils present in the Dc 12 Land Type, have a CEC range of 10 -18 $cmol_c\ kg^{-1}$ which is good, however these soils have other limitations such as effective rooting depth. The sandier soils, namely the red and yellow Avalon, Clovelly and Westleigh soils within the Bc 30 Land Type have a CEC of around 5 $cmol_c\ kg^{-1}$ which is on the lower side, however this is to be expected.

5 LAND CAPABILITY

Land capability is defined using a combination of soil, terrain and climate features. Land capability classes reflect the most intensive long term sustainable use of land under rain-fed conditions. An indication is also provided about the permanent limitations associated with the different land use class definitions (Schoeman, *et. al*., 2000).

Presently the areas earmarked for the mining infrastructure is used for agriculture namely mixed arable and grazing, see Plan 2. Mining will have an influence on land capability during mining operations because smaller areas are available for arable and grazing thereby putting more strain on areas in close proximity of the mining land, especially for grazing.

The topography and parent material within the plant area does not differ substantially, with the result that the soils are fairly homogeneous throughout the area. The soils are mostly sandy, with poor structure. The arable soil was farmed for a long time and the soil fertility is good due to fertilization. The cultivated lands are classified as arable Class II – III. The definitions used (Schoeman *et al*, 2000) are presented in paragraph 5.1 below while the grazed areas are classified as grazing Class V.

5.1 Arable

5.1.1 Class II (Avalon and Westleigh soil forms)

Land in Class II has some limitations that reduce the choice of plants or require moderate conservation practices. It may be used for cultivated crops, but with less latitude in the choice of crops or management practices than Class I. The limitations are few and the practices are easy to apply. For the purpose of informing the Bankable Feasibility Study, the following possible limitations need to be taken into account, in view of their influence on post mining rehabilitation.

Limitations may include singly or in combination the effects of (Schoeman *et al*, 2000):

- Gentle slopes;
- Moderate susceptibility to wind and water erosion;
- Less than ideal soil depth;
- Somewhat unfavorable soil structure and workability;
- Slight climatic limitations on soil use and management.

Limitations may cause special soil-conserving cropping systems, soil conservation practices, water-control devices or tillage methods to be required when used for cultivated crops.

5.1.2 Class III (Westleigh soil form)

Land in Class III has severe limitations that reduce the choice of plants or require special conservation practices, or both. Land may be used for cultivated crops, but has more restrictions than Class II. When used for cultivated crops, the conservation practices are usually more difficult to apply and to maintain. The number of practical alternatives for average farmers is less than that for soils in Class II. Limitations restrict, singly or in combination, the amount of clean cultivation, time of planting, tillage, harvesting, and choice of crops.

Limitations may result from the effects of one or more of the following:

- Moderately steep slopes;
- High susceptibility to water or wind erosion or severe adverse effects of past erosion;
- Frequent flooding accompanied by some crop damage;
- Very slow permeability of the subsoil;
- Wetness or some continuing waterlogging after drainage;
- Shallow soil depth to bedrock, hardpan, fragipan or clay pan that limit the rooting zone and the water storage;
- Low water-holding capacity;
- Low fertility not easily corrected; and
- Moderate climatic limitations.

5.2 Grazing

5.2.1 Class V (Valsrivier soil form)

Land in Class V has little or no erosion hazard but have other limitations impractical to remove that limit its use largely to pasture, range, woodland or wildlife food and cover. Limitations restrict the kind of plants that can be grown and prevent normal tillage of cultivated crops. Pastures can be improved and benefits from proper management can be expected. Land is nearly level. Some occurrences are wet or frequently flooded. Others are stony, have climatic limitations, or have some combination of these limitations.

Examples of Class V are:

- Valley bottoms subject to frequent flooding that prevents the normal production of cultivated crops;
- Nearly level land with a growing season that prevents the normal production of cultivated crops;
- Level or nearly level stony or rocky land; and
- Ponded areas where drainage for cultivated crops is not feasible but which are suitable for grasses or trees.
- Class VI include permanent waterlogged Ka soils in low lying wetland areas.

6 LAND USE

The present land use in the region is agriculture, mixed arable and grazing as presented on Plan 2 (Appendix A). The proposed mine and infrastructure sites are located on arable and grazing land thereby decreasing the areas available for farming. The land use will be changed from agriculture to industrial because farming can no longer continue due to the mining infrastructure present in addition to the mining activities taking place during operation.

7 REHABILITATION

Due to the long history of agriculture in the Free State most marginal arable areas are used for grazing while the arable areas are well established agricultural areas where the climate is better suited for agriculture. This is also true for the proposed Ventersburg Mine. However there is a general perception that although attempts are made by mining houses to rehabilitate mined areas, these attempts are generally less than satisfactory. Soil capability and therefore land capability and suitability of reclaimed land is generally degraded from arable pre mining natural capabilities to man-made post mining mainly grazing land capabilities needing special management and care.

More important than chemical imbalances which can be easily restored at cost, is soil compaction and volumes of replacement during soil reclamation. Heavy mining equipment is used during soil reclamation and soil is compacted beyond agricultural reclamation leaving

behind areas of low soil and land capabilities. Such areas have limited land use options but specialized management needs.

7.1 Soil Handling

The topsoil should be stripped from all areas where large infrastructure is located. The infrastructure areas needed to be stripped are the tailings dams, the plant site and discard dump. The topsoil present within the uncultivated grazed area is approximately 0.3 m deep. This dark clayey soil should not be mixed with the yellow and red topsoil, generally 0.5 – 0.8 m thick present at the cultivated areas. The topsoil should be stripped and stockpiled for later use in rehabilitation of the impacted sites after closure. The location of the topsoil stockpiles should be away from productive cultivated farm land near TSF 2 on the grazing land use delineated site, see Plan 2.

There are a number of basic principles that should be observed in regard to topsoil handling:

- Strip and place soils when dry, and not when wet. Handling of wet soils increases the loss of soil structure;
- Minimize the amount of handling, as the more handling takes place, the more the soil's structure is deteriorated (and the sandy soils in the project areas have very little structure to begin with);
- Avoid compaction of the soil, in situ, during handling, during storage and during placement, because compaction destroys soil structure;
- Stripping by means of excavator buckets, and loading on dump trucks, is preferable to stripping and loading by means of bowl-scrapers, even in sandy soils where bowl-scrapers might be an option (again, loss of soil structure is minimised);
- Restrict the height of topsoil of sandy soil stockpiles to 4 m and 2 m for clayey soil. High stockpiles result in compaction (due to placement as well as due to the mass of the stockpile), and a loss of soil structure and aeration, and loss of the biological component (soil micro-organisms including bacteria and fungi) all of which carry out essential ecological processes) in the topsoil; and
- Vegetate the stockpiles, to reduce risk of soil loss due to erosion, prevent weed growth and to reinstitute the ecological processes within the soil.

8 CONCLUSION

A variety of soil types were identified for the project area. The soils can be grouped into two groups namely heavy clay soils occupying areas dominated by grazing and sandy yellow soils occupying areas dominated by arable agriculture. Examples are Valsrivier, Avalon, Clovelly and Westleigh soils respectively.

The land capability of the proposed Ventersburg Mine can be classified as mixed arable and grazing. The agricultural potential of deep red and yellow soil is high while the agricultural potential of heavy clay soil is low.

Underground mining will not impact directly on the land capability although the above ground infrastructure will decrease land capability therefore changing the land use from agriculture to industrial.

9 RECOMMENDATIONS

The underground mining operation will not impact directly on the soil, land capability and land use during underground mining. However, the above ground infrastructure will impact on land capability due to the areas covered permanently by dumps, which will decrease land available to agricultural activities therefore decreasing land capability and changing land use from agriculture to industrial. Hence TSF 2 is recommended as it is in the heavy clay soils and has no impact an the high potential agricultural land.

The following recommendations have been provided due to the presence of cultivated dominating sandy soils in the landscape:

- Potentially water erosion can impact on the sandy cultivated soil at the arable delineated site, see Plan 2. Due to the inherent sandy soil composition the soil material have little cohesion between particles and thus can be picked up and transported by water, depending on the force applied at the time of impact. In addition very fine material contained in-between sandy fragments will be subjected to wind erosion where surfaces are bare and therefore exposed to the elements; hence erosion control measures are to be put in place, such as erosion berms and runoff control measures.
- Rehabilitate land affected by infrastructure, to the extent reasonably possible and in accordance with the Environmental Management Programme, back to pre-mining land capability for example grazing and arable agriculture proportionally;
- The stripped topsoil should be replaced after removal of large infrastructure such as the plant and shaft areas;
- Other areas that need to be rehabilitated with stripped and stockpiled topsoil are the tailings dams and discard dump. Soil would need to be borrowed from ather sources and erosion prevention would be required until re-vegetated areas are stable.
- Removable mining infrastructure is demolished post mining and that the land be rehabilitated back to pre-mining land capability, to the extent reasonably possible. Permanent features such as dumps need a sustainable vegetated soil cover to control water runoff and infiltration to prevent potential soil erosion and groundwater pollution.

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Appendix A: Plans

Plan 1: Land Types present at the Proposed Ventersburg Mine

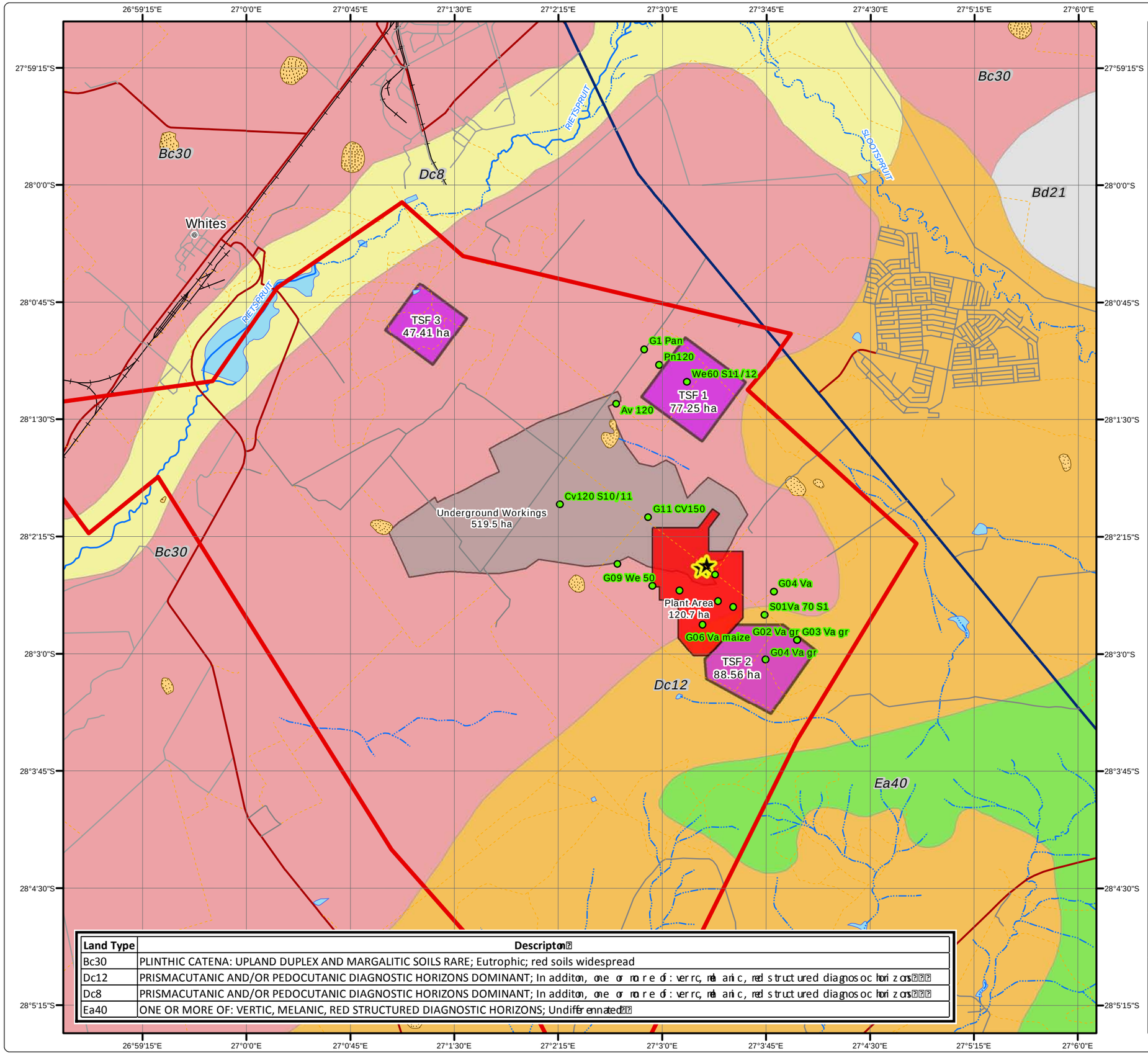
Plan 2: Dominant land uses at the Proposed Ventersburg Mine

Plan 3: Soil Forms and Sampling Points at the Proposed Ventersburg Mine

Plan 1

Ventersburg Gold ESIA

Land Type



Land Type	Description
Bc30	PLINTHIC CATENA: UPLAND DUPLEX AND MARGALITIC SOILS RARE; Eutrophic; red soils widespread
Dc12	PRISMACUTANIC AND/OR PEDOCUTANIC DIAGNOSTIC HORIZONS DOMINANT; In addition, one or more of: vertic, melanic, red structured diagnostic horizons
Dc8	PRISMACUTANIC AND/OR PEDOCUTANIC DIAGNOSTIC HORIZONS DOMINANT; In addition, one or more of: vertic, melanic, red structured diagnostic horizons
Ea40	ONE OR MORE OF: VERTIC, MELANIC, RED STRUCTURED DIAGNOSTIC HORIZONS; Undifferentiated

Legend

- Project Area
- Soil Sampling Points
- Arterial / National Route
- Main Road
- Minor Road
- Tracks
- Railway Line
- Perennial Stream
- Non-Perennial Stream
- Dam / Lake
- Non-Perennial Pan
- Perennial Pan

Land Type

- Bc30
- Dc12
- Dc8
- Ea40

Infrastructure

- Shafts
- TSF Dam
- Plant Area
- Underground Workings

DIGBY WELLS ENVIRONMENTAL

www.digbywells.com

Projection: Transverse Mercator
Datum: Hartebeeshoek 1984
Central Meridian: 27°E

Ref #: tdm.GOL1675.201211.041
Revision Number: 1
Date: 09/11/2012

N

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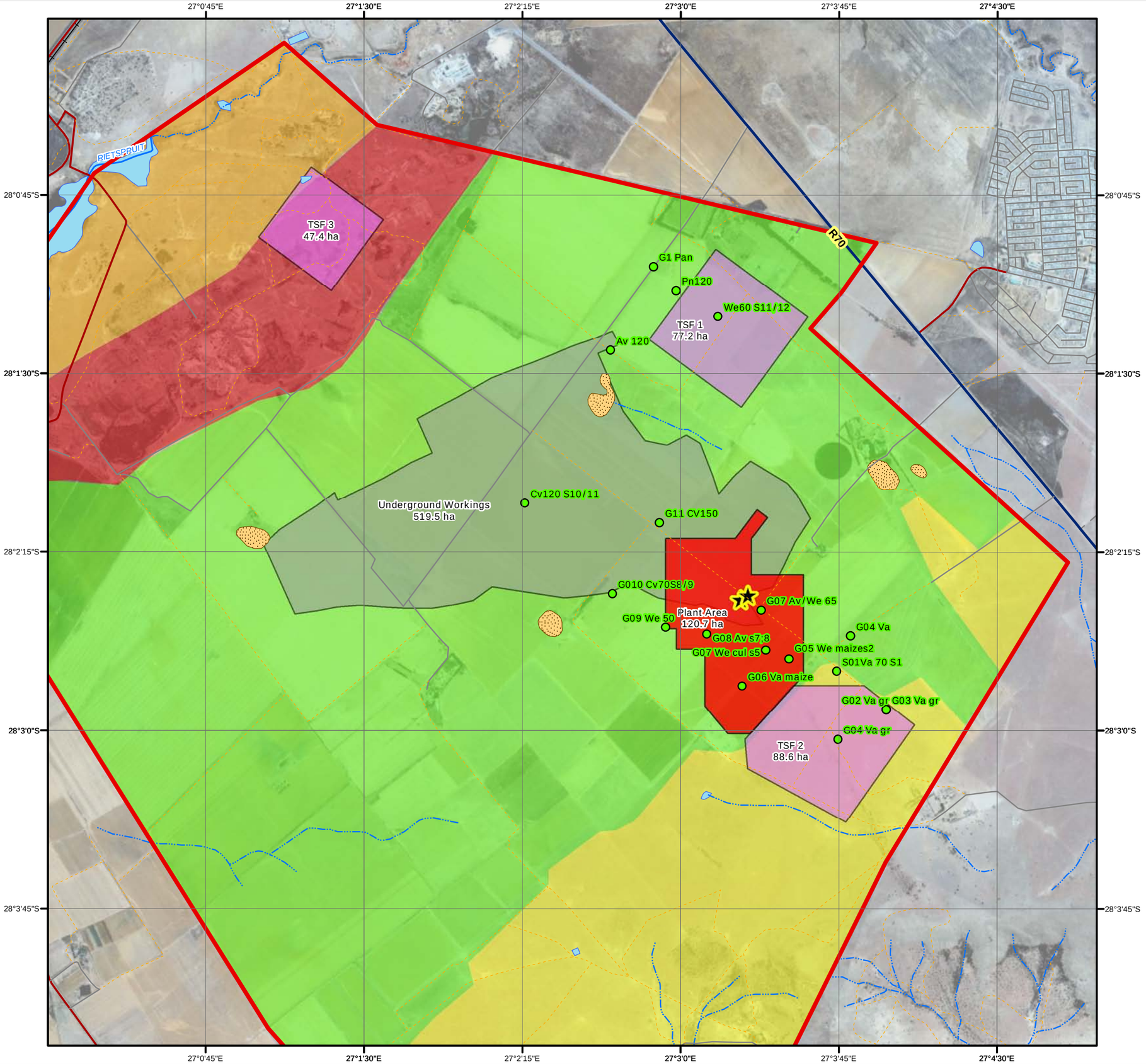
Kilometres

1:45 000

Plan 2

Ventersburg Gold ESIA

Land Use



Legend

- Project Area
- Soil Sampling Points
- Arterial / National Route
- Main Road
- Minor Road
- Tracks
- Railway Line
- Perennial Stream
- Non-Perennial Stream
- Dam / Lake
- Non-Perennial Pan
- Perennial Pan

Land Use

- Arable
- Disturbed
- Grazing
- Wilderness

Infrastructure

- Shafts
- Plant Area
- Underground Workings
- Tailings

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Projection: Transverse Mercator
Datum: Hartebeeshoek 1984
Central Meridian: 27°E

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Date: 09/11/2012

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Kilometres

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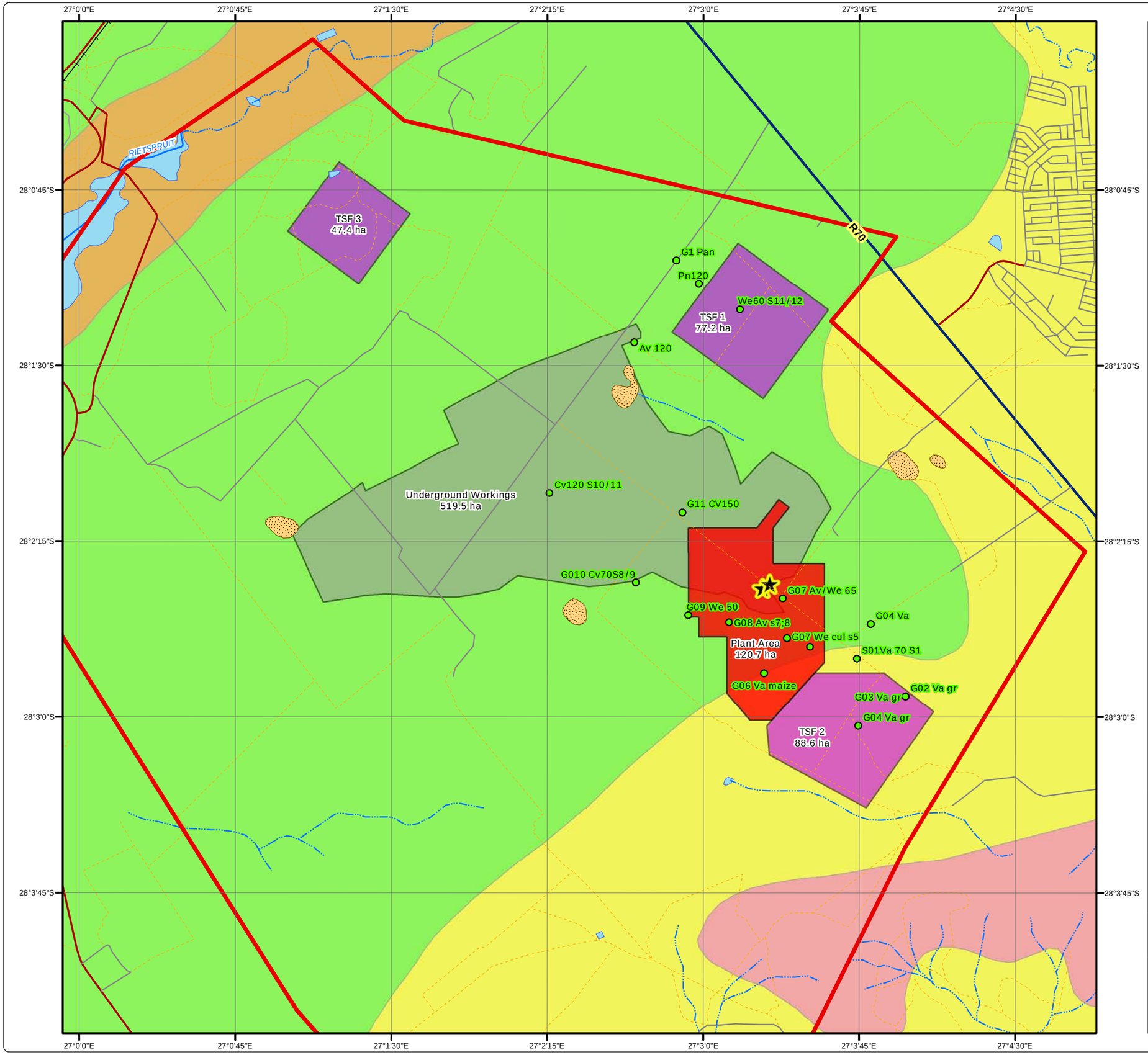
Plan 3

Ventersburg Gold ESIA

Soil Forms & Sampling Points



Legend

- Soil Sampling Points
- Project Area
- Arterial / National Route
- Main Road
- Minor Road
- Tracks
- Railway Line
- Perennial Stream
- Non-Perennial Stream
- Dam / Lake
- Non-Perennial Pan
- Perennial Pan

Soil Forms

- Sandy Yellow Soils
- Heavy Clay Soils
- Heavy Clay Soils
- Shallow Rocky Soils

Infrastructure

- Shafts
- Plant Area
- Underground Workings
- Tailings

DIGBY WELLS ENVIRONMENTAL

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Projection: Transverse Mercator	Ref #: tdm.GOL1675.201301.012
Datum: Hartebeeshoek 1984	Revision Number: 1
Central Meridian: 27°E	Date: 08/01/2013

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Kilometres

1:30 000

Appendix B: Expertise of Specialist

HENDRIK SMITH

Mr. Hendrik Smith

Soil Scientist

Biophysical Department

Digby Wells Environmental

Pri. Sci. Nat.

1 EDUCATION

- 2005 PhD (Interdisciplinary), Commonwealth Open University;
- 1990 MSc (Agric) Soil Science, University of Pretoria;
- 1983 BSc (Agric) Hons. Soil Science, University of the Free State; and
- 1978 BSc (Agric) Soil Science and Plant Nutrition, University of Pretoria.

2 EMPLOYMENT

Jan 1981 – Jul 1999:	Institute for Soil Climate and Water, Agricultural Research Council;
Jul 1999 – Sept 2003:	Soil consultant and Shell the Garage Franchise owner;
Sept 2003 – Jan 2008:	Researcher, University Pretoria;
Jan 2008 – Feb 2009:	Private Soil consultant; and
Feb 2009 – Current:	Joined Digby Wells Environmental.

3 EXPERIENCE

Hendrik Smith is a registered Professional Natural Scientist (Soil Science) with the South African Council for Natural Scientific Professions. His present area of focus is soil surveying. He also assists with the relevant sections of Rehabilitation Guidelines, EIAs and EMPRs. He is part of the Bio-physical Department at Digby Wells Environmental. The Department focuses on combining and actively promoting the utilisation of various disciplines within the field of environmental management which include fauna, flaura and aquatics.

3.1 Soil Digital Mapping

Field surveys are supported by predictive digital soil mapping (DSM) as a tool to obtain required soil maps. Site specific topography determines soil profile development in landscapes. The formation of different soil forms occurring in landscapes is influenced by

time, organisms, climate, dominating terrain types present as well as by the underlying parent material. Soil distribution patterns are determined by dominating landscape terrain units which can be used and studied using DSM. Soil distribution patterns follow specific sequences in landscapes. These sequences are defined as toposequences. The combination of landscaspe terrain unit and toposequence data in DSM (determined by existing landtype information in addition to field observations) facilitates large soil surveys greatly through more accurate delineation of soil types.

DSM assessment on a large scale (more than 10 000 ha) was used in Tete, Mozambique and Mpumalanga, South Africa.

3.2 Rehabilitated Land

Rehabilitation of mined land especially in opencast mining requires careful planning and management of soil. Soil is a non-renewable resource because 1 cm of soil takes approximately 100 years to form. This is an important consideration when high potential arable soil (maize fields for example) is opencast mined. Rehabilitation is expensive and poor quality soils resulting from processes and guidelines not adhered to cannot be reclaimed easily. The effects of poor rehabilitation on soil are well understood and guidance regarding soil rehabilitation can be provided for use in mine rehabilitation plans and EMP documents.

The processes involved in the rehabilitation of opencast mined land are well understood and guidance can be provided for planning post mining land use post land capability determination.

3.3 Environmental Related Experience

- Soil delineations: Mali, Mozambique, Lesotho and South Africa;
- Wetland Offset Strategy: South Africa;
- Soil rehabilitation: South Africa;
- The effects of soil properties and electrolyte concentration on surface sealing and runoff;
- Reclamation of soil surface sealing and crusting using soil ameliorants;
- The effects of industrial effluents (water quality) on soils;
- Evaluation of organic composted products, lime, gypsum and fertilizers for heavy metals and other health-related micro-elements;
- The influence of heavy metals and health-related micro-elements on soil, plant and water system;
- Reclamation of a sacrificial sewage sludge dumping site;
- Reclamation of sodic and saline industrial sites;
- Reclamation of a coarse ash dump site.Reclamation of a kimberlite dump site;
- Soil surveys and agricultural potential studies;

- Wetland delineation soil surveys; and,
- Managing orchard root zone electrical conductivity and fertility using wetting front detectors.

4 RELEVANT TRAINING

- Soil Classification and Wetland Delineation – Terra Soil Science.

5 PROFESSIONAL AFFILIATIONS

Registered as a soil scientist with the South African Council for Natural Scientific Professions (Pr.Sci.Nat. Soil Science).

Hendrik is a member of the following relevant bodies:

- The Soil Science Society of South Africa since 1981; and
- The South African Soil Surveyors Organization.

APPENDIX 14

SOIL IMPACT ASSESSMENT (2017)


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prime | resources
environmental
consultants

GOLD ONE AFRICA LIMITED

SOIL, LAND USE AND LAND CAPABILITY IMPACT ASSESSMENT FOR THE PROPOSED VENTERSBURG PROJECT, FREE STATE

JANUARY 2017

PREPARED FOR:

Gold One Africa Limited
Constantia Office Park
Bridgeview House
Corner 14th Avenue and Hendrik Potgieter Street
Weltevreden Park

Director PJ Theron Reg no. 2003/015987/07

Declaration of Independence

Prime Resources is an independent environmental consulting firm with no vested interest in the proposed project other than to fulfil the contract for delivery of specialised services including, among others, those stipulated in the terms of reference.

I, Louise Jones, in my capacity as a specialist consultant, hereby declare that I –

- Act as an independent consultant;
- Do not have any financial interest in the undertaking of the activity, other than remuneration for the work performed in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998);
- Have no, and will not engage in, conflicting interests in the undertaking of the activity;
- Undertake to disclose, to the competent authority, any material information that has or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the National Environmental Management Act, 1998 (Act 107 of 1998);
- Will provide the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not;
- Based on information provided to me by the project proponent and in addition to information obtained during the course of this study, have presented the results and conclusion within the associated document to the best of my professional ability;
- Reserve the right to modify aspects pertaining to the present investigation should additional information become available through ongoing research and/or further work in this field; and
- Undertake to have my work peer reviewed on a regular basis by a competent specialist.

Soil, Land Use and Land Capability Baseline Assessment Report Compiled by:	**Soil, Land Use and Land Capability Impact Assessment Report Compiled by:**
Digby Wells Environmental in April 2013 Hendrik Smith, Soil Scientist	Prime Resources in January 2017 Louise Jones, Environmental Scientist

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APPENDICES

Appendix 1: Prime Resources Company Profile and Key Personnel CVs

LIST OF ACRONYMS

CARA	Conservation of Agricultural Resources Act No. 43 of 1983
CEC	Cation Exchange Capacity
DMR	Department of Mineral Resources
ECA	Environmental Conservation Act No. 73 of 1989
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme Report
LDM	Lejweleputswa District Municipality
MLM	Matjhabeng Local Municipality
MPRDA	Mineral and Petroleum Resources Development Act No. 28 of 2002
NEMA	National Environmental Management Act No. 107 of 1998
NWA	National Water Act No. 36 of 1998
PCD	Pollution Control Dam
RoM	Run of Mine
TSF	Tailings Storage Facility
WRD	Waste Rock Dump

1 INTRODUCTION

Gold One Africa Limited ("Gold One" or the Applicant) holds five contiguous prospecting rights (DMR Reference: FS 10140 PR, FS 10228 PR, FS 10229 PR, FS 10087 PR and FS 10080 PR) over various farm portions (between the towns of Hennenman and Ventersburg in the Free State) and proposes to develop an underground mining operation - the proposed Ventersburg Project.

The life of mine of the proposed Ventersburg Project is expected to be 17 years, including four years for construction. Planned commencement of construction is estimated to be in 2021. It is assumed that mining operations will commence in the year 2025 and will continue for 13 years, until the year 2038.

The Applicant has appointed Prime Resources (Pty) Ltd ("Prime Resources") to conduct the scope associated with this Soil, Land Use and Land Capability Impact Assessment Report, the purpose of which is to inform the Environmental Impact Assessment (EIA) and Environmental Management Programme Report (EMPr) for the proposed Ventersburg Project.

1.1 Details of Author

Name of Firm:	Prime Resources (Pty) Ltd
Physical Address:	70 - 7th Avenue, Parktown North, Johannesburg
Postal Address:	PO Box 2316, Parklands, 2121
Telephone Number:	011 447 4888
Fax Number:	011 447 0355
Email:	prime@resources.co.za

Prime Resources is a specialist environmental consulting firm providing environmental and related services, and was established in 2003. Prime Resources was founded by Peter Theron (PrEng, SAIMM), who has over 27 years' experience in the field of environmental science and engineering.

Gené Main (Pr. Sci. Nat, Environmental Science), the Project Manager for the proposed project, has a M.Sc. (Botany) from the University of the Western Cape and ten years' experience in the field of environmental consulting.

Louise Jones, the environmental scientist and principal author, has a M.Sc. (Environmental Sciences) from the University of the Witwatersrand and four years' experience in the field of environmental consulting.

A copy of the Prime Resources Company Profile and Key Personnel CVs are attached as Appendix 1.

This report has been compiled based on the Soil, Land Use and Land Capability Baseline Assessment Report compiled by Digby Wells Environmental in April 2013.

1.2 Scope

The aim of this study was to produce a Soil, Land Use and Land Capability Impact Assessment Report on the area to be affected by the proposed Ventersburg Project. This document serves as an impact assessment report and must be read in conjunction with the Soil, Land Use and Land Capability Baseline Assessment Report compiled by Digby Wells Environmental in April 2013. The impacts on soil, land use and land capability were assessed, based on the findings of the Baseline Assessment Report.

The following aspects are included in this report:

- Potential impacts (including cumulative impacts) of the proposed mining activities on soil and agricultural resources were assessed for the construction, operation, closure / decommissioning and post-closure phases (i.e. significance in terms of nature, duration, extent, magnitude and probability);
- Impacts were rated as to their significance both pre- and post-mitigation;
- Recommendations for erosion management on site were described;
- Mitigation measures were recommended for the management of identified impacts; and
- A soil monitoring programme was compiled.

1.3 Relevant Legislation

Soils and land capability are protected under the National Environmental Management Act No. 108 of 1998 (NEMA), the Environmental Conservation Act No. 73 of 1989 (ECA), the Mineral and Petroleum Resources Development Act No. 28 of 2002 (MPRDA), the Conservation of Agricultural Resources Act No. 43 of 1983 (CARA) and the National Water Act No. 36 of 1998 (NWA).

This study was conducted in accordance with Section 13(1)(a-f) of the NEMA EIA Regulations (GNR982 of 2014) and this report was aligned with the reporting requirements for specialist assessments as stipulated in Appendix 6 of these same Regulations.

1.4 Proposed Project Area

The project area is situated within the Lejweleputswa District Municipality (LDM) and the Matjhabeng Local Municipality (MLM), and more specifically is located 2.8 km south-west of Phomolong, 8.4 km south of Hennenman and 9.2 km north-west of Ventersburg in the Free State Province. The project area is easily accessed via the R70 regional highway between Hennenman and Ventersburg (Figure 1 below). The property is not related to or adjacent to any other operating or historic gold mine, the closest of which is about 15 km away (near Virginia).

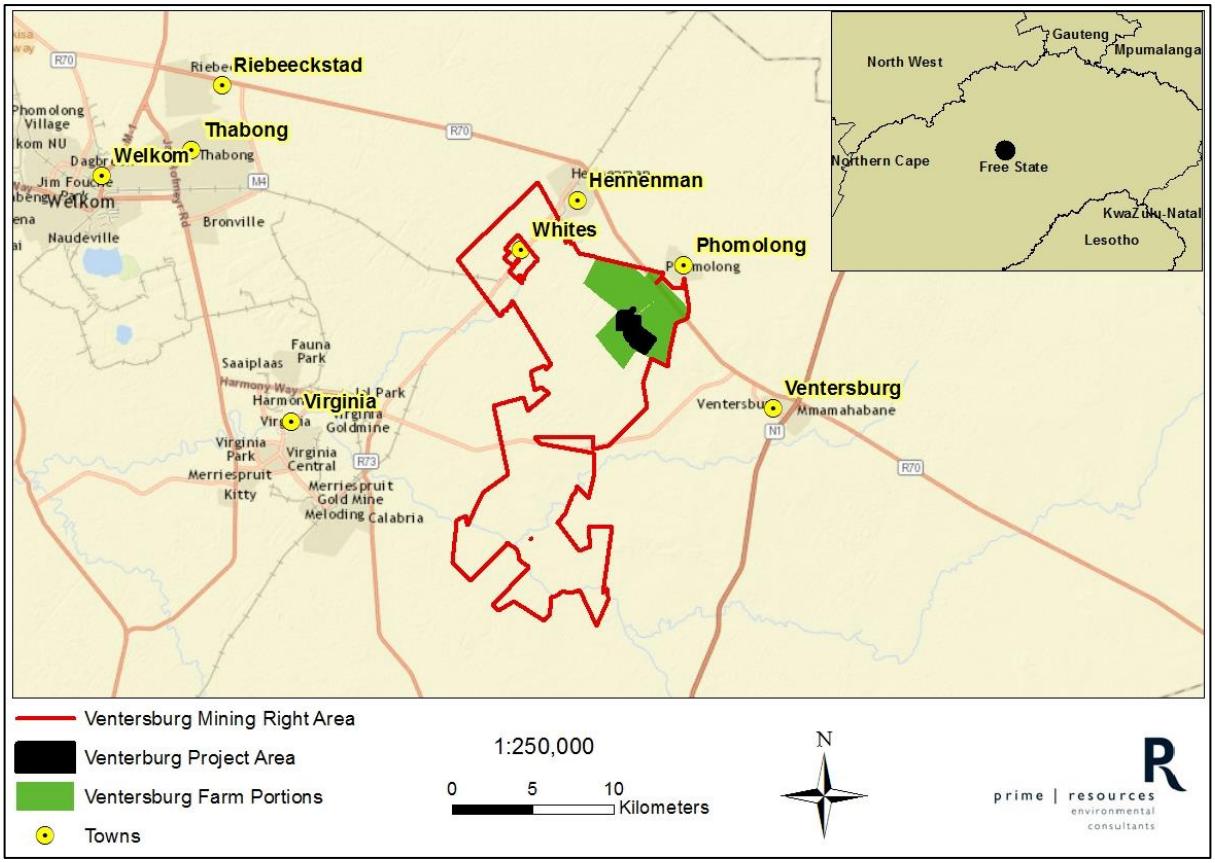

Figure 1: Project locality

1.5 Project Description

The proposed Ventersburg Project will comprise of a main shaft and ventilation shaft. The Run of Mine (RoM) ore and the waste rock will be hoisted separately at the Main Shaft. Full production will be reached in year 9 at 80,000 tonnes of RoM ore per month which will be maintained for seven years. An estimated 30,000 tonnes of waste rock will be generated per month at steady state.

Prior to the commissioning of the processing plant, RoM ore will be trucked from the shaft headgear bin to the ore emergency/commissioning stockpile. Once the processing plant has been commissioned, ore will be reclaimed from the ore emergency/commissioning stockpile with a front end loader and fed onto the conveyor to be transported to the processing plant.

Groundwater in the underground workings will be dewatered and pumped to surface to be treated at a water treatment facility. The treated excess water will be discharged to the Rietspruit via a pipeline. Excess water is to be treated to discharge standards (to be stipulated by the Department of Water and Sanitation) and will therefore be considered as clean water. The maximum volume of treated water to be discharged is 6 Mℓ per day at steady state for 13 years, with a ramp up of between 1 and 3 Mℓ per day for the first four years during construction.

Tailings from the processing plant will be disposed of on a tailings storage facility (TSF).

Surface Infrastructure (See Figure 2 below)

The footprint of the proposed surface infrastructure associated with the proposed Ventersburg Project is approximately 250 ha and comprises:

- Main shaft, conveyor transfer houses and conveyor systems, ventilation shaft, workshops, stores, salvage yard, waste transfer area, power lines and substations, topsoil stockpile, pipeline network, office and administrative buildings, processing plant, bulk fuel storage facility, emulsion storage silos and on site access and haul roads.
- Mining material and waste infrastructure to be constructed includes an emergency/commissioning ore stockpile, waste rock dump (WRD) and (TSF) (which will be lined as per legislative requirements and equipped with pollution control infrastructure).
- Water management infrastructure includes various dams, pollution control infrastructure, water treatment facility and pipeline to discharge treated water to the Rietspruit.

After operations cease, decommissioning will commence. A period of 1 year has been assumed for decommissioning and rehabilitation, during which all the surface infrastructure components aside from the TSF and WRD will be removed and the disturbed areas rehabilitated.

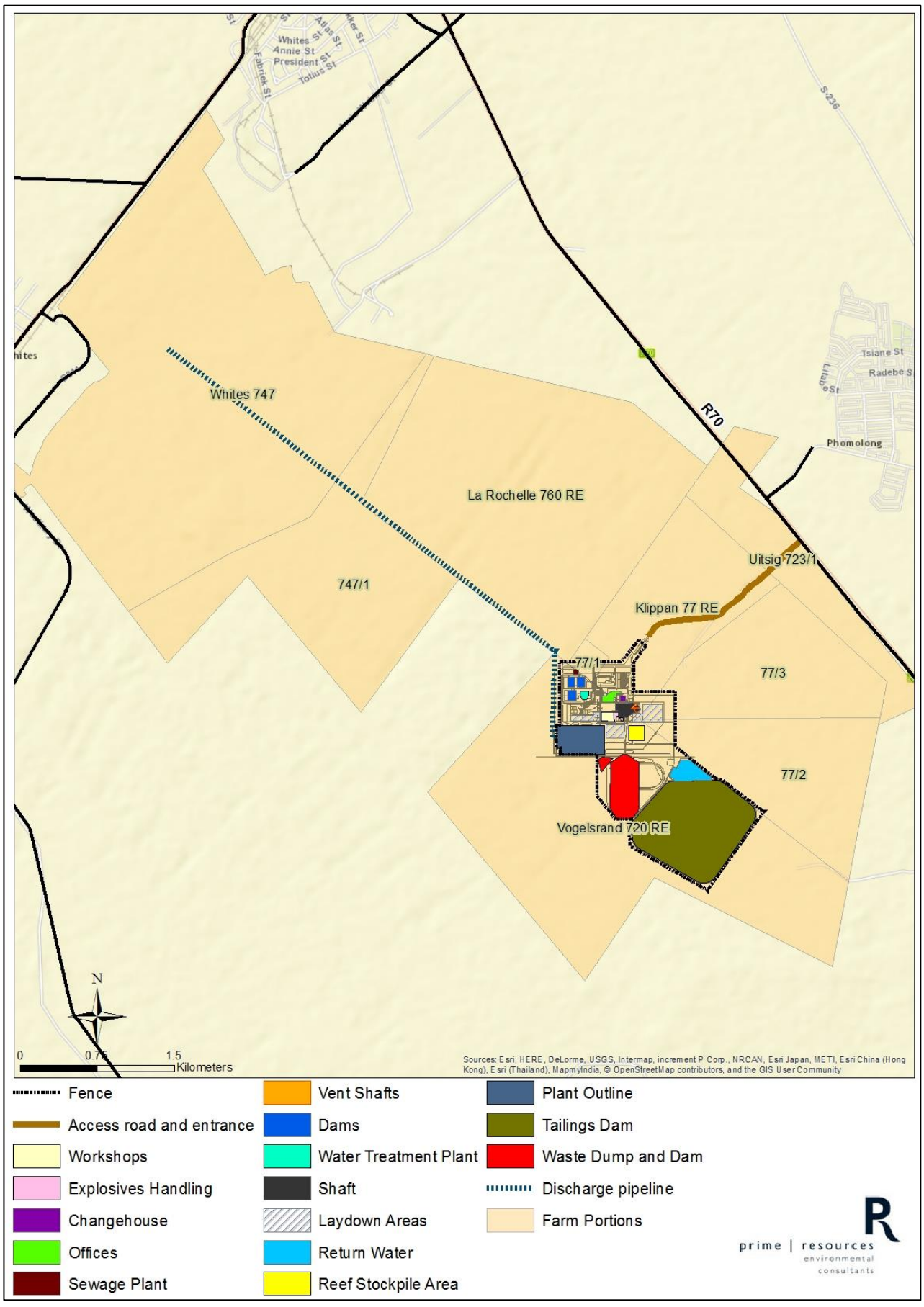

Figure 2: Surface infrastructure considered for the Soil Impact Assessment

2 IMPACT ASSESSMENT

The purpose of this section of the study was to identify and assess the significance of the potential impacts on soil, land use and land capability caused by the proposed mining activities and to provide a description of the mitigation required to potentially limit the perceived impacts on the natural environment.

The soils in this area are fairly homogeneous in nature and follow the natural topography of the area. The soils can be grouped into two groups, namely sandy yellow soils occupying areas dominated by arable agriculture, and heavy clay soils occupying areas dominated by grazing.

Yellow sandy soils - Bc30 (Processing plant, shafts, offices, workshops, discharge pipeline etc.)

- Consisting of Avalon, Clovelly and Westleigh soil
- High agricultural potential
- Used for mixed arable agriculture
- Low CEC range around 5 $cmol_c\ kg^{-1}$

Heavy darker clay soils - Dc12 (Portion of WRD, entire TSF and TSF return water dam)

- Consisting of Valsrivier soil
- Limited effective rooting depth
- Low agricultural potential
- Used for grazing
- Good CEC range between 10 - 18 $cmol_c\ kg^{-1}$

The anticipated impacts of the proposed mine and associated activities are provided below for the construction, operation, closure / decommissioning and post-closure phases.

Approximately 119 Ha of the Sandy Yellow Soils (Bc30), 120 Ha of the Heavy Clay Soils (Dc12) and 1 Ha of the Heavy Clay Soils (Dc8) will be impacted by the proposed surface infrastructure (see Figure 3 below).

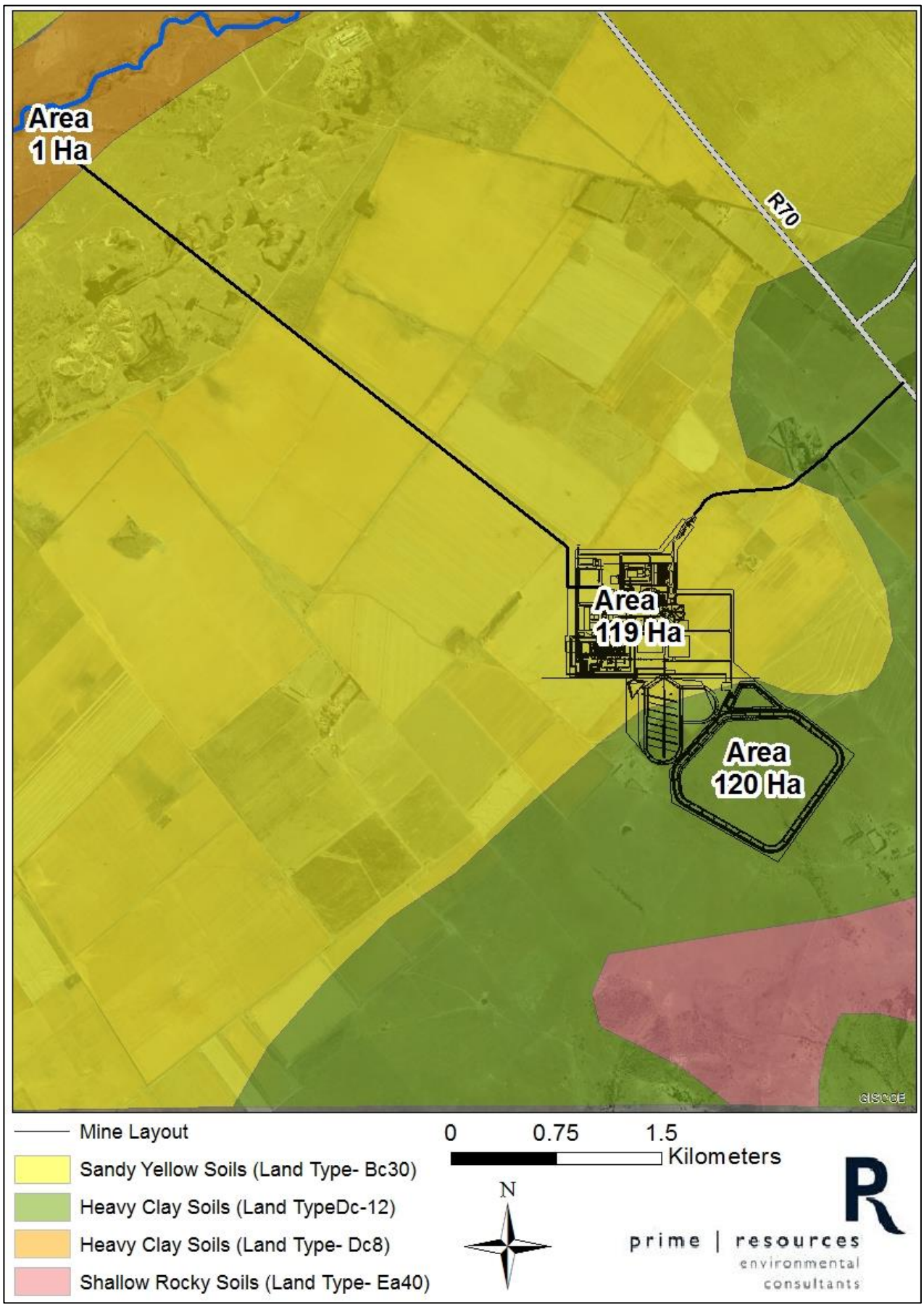

Figure 3: Soil Form and Land Type with the proposed mine infrastructure

2.1 Impact Rating Methodology

SIGNIFICANCE = (MAGNITUDE + DURATION + SCALE) X PROBABILITY

The maximum potential value for significance of an impact is 100 points. Environmental impacts can therefore be rated as high, medium or low significance on the following basis:

- High environmental significance 60 – 100 points
- Medium environmental significance 30 – 59 points
- Low environmental significance 0 – 29 points

Magnitude (M)	Duration (D)
10 – Very high (or unknown)	5 – Permanent
8 – High	4 – Long-term (ceases at end of operation)
6 – Moderate	3 – Medium-term (5-10 years)
4 – Low	2 – Short-term (0-4 years)
2 - Minor	1 - Immediate
Scale (S)	**Probability (P)**
5 – International	5 – Definite (or unknown)
4 – National	4 – High probability
3 – Regional	3 – Medium probability
2 – Local	2 – Low probability
1 – Site	1 – Improbable
0 – None	0 – None

2.2 Construction Phase

2.2.1 Erosion and compaction

The erodibility of soils can be defined as low, medium or high.

- Low - Soils with stable physical and chemical properties that occur on flat to gentle slopes ensuring low erosion susceptibility in the natural state. Few erosion protection measures are necessary.
- Medium - Soils with low to moderately unstable physical or chemical properties or soils occurring on moderate to steep slopes. Sheet and rill erosion often occur in the natural state but may become severe when disturbed or due to any misuse such as overgrazing. Erosion protection measures are necessary.
- High - Soils with unstable physical and chemical properties or soils occurring on very steep slopes. Rill and donga erosion often occur in the natural state and will become

severe during any disturbance or misuse. Specialized erosion protection measures are necessary.

Construction activities will result in the alteration of the natural surface topography as the area is relatively flat. There is high erosion potential around the TSF and a portion of the WRD, where the heavy darker clay soils occur. The Valsrivier soils occurring in this area are highly erodible due to the dispersive nature of the subsoils (B horizons). Once the A horizon has been penetrated by erosion the subsoil will erode rapidly and large gullies can be formed. There is medium erosion potential for the rest of the site where the yellow sandy soils occur. Water erosion can impact on the sandy cultivated soils which have little cohesion between particles and thus can be picked up and transported by water, depending on the force applied at the time of impact. In addition very fine material contained in-between sandy fragments will be subjected to wind erosion where surfaces are bare and therefore exposed to the elements.

During construction vegetation will be cleared and topsoil will be stockpiled. Excessive stormwater run-off from cleared areas, constructed hard standing areas and roads, and within the mining footprint will accentuate the problem of erosion within these areas. Any stockpiled soil is at risk from wind and water erosion. There is a high probability that topsoil and subsoil will also be lost due to wind and water erosion. Soil compaction will also occur as a result of heavy mining equipment on site. The impact of erosion on the soil quality and fertility is considered to be of **medium** significance prior to and after the implementation of the mitigation measures listed below (refer to Table 1).

Mitigation Measures

- Stormwater management measures, to attenuate stormwater volumes and decrease velocity, must be in place during soil stripping operations to prevent soil losses due to water erosion.
- Vegetation clearance must be permitted only on those areas intended for infrastructure development.
- Erosion control measures are to be put in place, such as erosion berms and runoff control measures.
- Erosion prevention measures (refer to Soil Management Plan in Section 3 below) must be put in place in existing exposed / eroded areas to ensure that erosion in these areas is not accentuated.
- Soils must be stockpiled for post-mining rehabilitation (refer to Soil Management Plan in Section 3 below).
- All stockpiles must also be protected by a berm wall to prevent water erosion of stockpiled material by deflecting stormwater run-off.
- Restrict the height of the topsoil stockpiles to 4 m.
- Other soil storage stockpiles should be restricted where possible to heights of less than 4-5 m so as to avoid damage to the soil seed bank.
- The side slopes and surface areas must be vegetated with locally adapted perennial or annual seed mixtures of grasses in order to prevent water and wind erosion.

2.2.2 Contamination

The presence of construction vehicles and heavy earthmoving machinery may result in contamination of the soil due to hydrocarbon leaks. Contaminants are defined as substances present in an environmental medium (soil in this case) at concentrations in excess of natural background concentrations and that have a potential to cause harm to human health or the environment. There is also the potential for the contamination of soil from construction materials such as cement. The impact of soil contamination is considered to be of medium significance prior to the implementation of the mitigation measures listed below, but can be reduced to **low** with their implementation (refer to Table 1).

Mitigation Measures

- General maintenance and safety precautions must be followed to prevent diesel and hydraulic fluids contaminating the soil. If a spill occurs it must be reported and addressed immediately (as detailed in the Ventersburg Project EMPr, Hydrocarbon Management Plan).
- Cement storage and batching must take place on an impermeable surface.

2.2.3 Soil quality, fertility and soils with agricultural potential

Presently the area earmarked for the mining infrastructure is used for agriculture, namely mixed arable (cultivation) and grazing. The TSF falls within the grazing land use area while the remaining surface infrastructure falls within the arable land use area. The cultivated lands are classified as arable Class II – III and the grazed areas are classified as grazing Class V. The soil form boundaries follow the land type and land capability boundaries closely. A large area of the Bc land type is used for agriculture due to the arable soil capability present in this land type.

Construction activities will have an influence on the land capability because smaller areas will be available for agriculture and grazing. The land use (of the surface footprint) will change from agriculture (grazing) to industrial use for the life of the mine. The permanent loss of the arable agriculture land over the surface infrastructure areas and the grazing land over the TSF is considered to be of **high** significance and cannot be mitigated (refer to Table 1).

In the areas currently used for agriculture (cultivation), ineffective stockpile management may have a negative impact on the soil quality and fertility and may result in a loss of soils with agricultural potential. The depth of the stockpile and the length of time it is stored affect the quality and fertility of the soil. Stockpiling and subsequent mixing of soil layers during handling will alter and have a negative effect on the basic soil properties. The impact of stockpiling on soil quality and fertility is considered to be of **medium** significance prior to and after the implementation of the mitigation measures listed below (refer to Table 1).

Mitigation Measures

- Strategic and planned stockpiling must be undertaken to retain soil quality and fertility (refer to Soil Management Plan in Section 3 below).

Table 1: Construction Phase Ratings

PROCESS	IMPACT	MAGNITUDE (M)	DURATION (D)	SCALE (S)	PROBABILITY (P)	SIGNIFICANCE	
						RATING	VALUE
▪ Clearing of vegetation across the surface infrastructure areas ▪ Construction of surface infrastructure and roads ▪ Heavy vehicles and earth moving machinery on site	▪ Increase in soil erosion ▪ Compaction	8 [6]	2 [2]	2 [2]	4 [4]	Medium [Medium]	48 [40]
▪ Potential hydrocarbon leaks and construction material such as cement ▪ Heavy vehicles and earth moving machinery on site	Soil contamination	6 [4]	2 [2]	1 [1]	4 [3]	Medium [Low]	36 [21]
Construction of surface infrastructure	Permanent loss of arable agriculture land	8	5	1	5	High	70
Construction of TSF	Permanent loss of grazing land	6	5	1	5	High	60
Stripping and stockpiling of topsoil and subsoil	Reduced soil quality and fertility due to ineffective stockpile management	8 [6]	4 [4]	1 [1]	4 [3]	Medium [Medium]	52 [33]

2.3 Operation Phase

2.3.1 Erosion and loss of soil resources

As with the construction phase, excessive stormwater run-off from cleared areas, constructed hard standing areas and roads, and within the mining footprint will accentuate the problem of erosion on site and within adjacent areas. Stockpiled soil is also at risk from wind and water erosion. The impact of the potential increase in erosion is considered to be of **medium** significance prior to- and after the implementation of the mitigation measures listed below (refer to Table 2).

Mitigation Measures

- Stormwater management measures, to attenuate stormwater volumes and decrease velocity, must be in place throughout mining operations to prevent water erosion on site

and adjacent areas. Proper stormwater management measures must be implemented to ensure a free draining rehabilitated landscape.

- Effective stockpile management (refer to Soil Management Plan in Section 3 below) must be carried out throughout the operation phase to prevent wind and water erosion of stockpiled soil.

2.3.2 Contamination

The presence of heavy vehicles and heavy earthmoving machinery may result in contamination of the soil due to hydrocarbon leaks. Inappropriate storage and handling of hazardous substances as well as general and hazardous waste may result in the contamination of soil. Spills and run-off due to ineffective dirty water management on site may also lead to soil contamination. The impact of soil contamination is considered to be of **medium** significance prior to the implementation of the mitigation measures listed below, but can be reduced to **low** with their implementation (refer to Table 2).

Mitigation Measures

- General maintenance and safety precautions must be followed to prevent diesel and hydraulic fluids contaminating soil. If a spill occurs it must be reported and addressed immediately (as detailed in the Ventersburg Project EMPr, Hydrocarbon Management Plan).
- Good housekeeping practices must be employed in terms of the management of hazardous substances, and general and hazardous waste. There must be a bunded waste storage area on site that has an impermeable surface and a sump, and the area must be covered with a roof.
- An effective dirty water management system must be maintained throughout the life of mine.
- Periodic soil contamination assessments, entailing soil analyses for pH, EC and the metals, metalloids, hydrocarbons and anions listed in in terms of the "Soil Screening Values from GNR 331 of 2014 National Norms and Standards for the Remediation of Contaminated Land and Soil Quality" must be carried out. The periodic soil contamination assessments will facilitate the identification of potential source, pathway, and receptor elements where contamination occurs, and consequently reveal appropriate remedial action(s) where necessary.

2.3.3 Soil quality, fertility and soils with agricultural potential

Stockpiled soils will be used during rehabilitation at the end of the life of mine. Ineffective stockpile management and rehabilitation could have a negative impact on soil quality and fertility, subsequently affecting the future land capability. The impact of stockpiling on soil quality and fertility is considered to be of **medium** significance prior to the implementation of the mitigation measures listed below, but can be reduced to **low** with their implementation (refer to Table 2).

Mitigation Measures

Effective stockpile management (refer to Soil Management Plan in Section 3 below) must be carried out throughout the operation phase.

Table 2: Operation Phase Ratings

PROCESS	IMPACT	MAGNITUDE (M)	DURATION (D)	SCALE (S)	PROBABILITY (P)	SIGNIFICANCE	
						RATING	VALUE
▪ Increased overland flow on bare areas once the vegetation is cleared ▪ Excessive stormwater run-off from constructed hard standing areas and roads, and within the mining footprint	Increase in soil erosion	8 [8]	5 [5]	1 [1]	4 [3]	Medium [Medium]	56 [42]
▪ Heavy vehicles and earth moving machinery on site ▪ Potential hydrocarbon leaks, hazardous substances and waste	Soil contamination	8 [6]	2 [2]	1 [1]	4 [3]	Medium [Low]	44 [27]
Ineffective stockpile management	Reduced soil quality fertility	8 [6]	5 [5]	1 [1]	4 [2]	Medium [Low]	56 [24]

2.4 Decommissioning Phase

2.4.1 Erosion and loss of soil resources

Excessive stormwater run-off from newly rehabilitated areas, which have not yet been vegetated or where vegetation has not re-established may result in erosion. The impact of the potential increase in erosion is considered to be of considered to be of **medium** significance prior to the implementation of the mitigation measures listed below, but can be reduced to **low** with their implementation (refer to Table 3).

Mitigation Measures

- Erosion prevention measures (refer to Soil Management Plan in Section 3 below) must be put in place until vegetation has re-established.
- Proper stormwater management measures must be implemented to ensure a free draining rehabilitated landscape and erosion-sensitive areas must be monitored.
- Contoured terraces could be implemented during decommissioning to reduce velocity and spread volume of runoff water. Terracing entails creating level embankments at different elevations across a slope, along its elevation contours, in order to minimize runoff and soil

erosion. The different terrace levels would promote efficient water infiltration into the soil and minimise erosion and siltation impacts after closure.

2.4.2 Contamination

The presence of heavy vehicles and heavy earthmoving machinery during decommissioning may result in contamination of the soil due to hydrocarbon leaks. Inappropriate storage, handling, and removal of hazardous substances as well as general and hazardous waste may result in the contamination of soil. Spills and run-off due to ineffective dirty water management on site may also lead to soil contamination. The impact of soil contamination is considered to be of **medium** significance prior to the implementation of the mitigation measures listed below, but can be reduced to **low** with their implementation (refer to Table 3).

Mitigation Measures

- General maintenance and safety precautions must be followed to prevent diesel and hydraulic fluids contaminating soil. If an incident occurs it must be reported and addressed immediately (as detailed in the Ventersburg Project EMPr, Hydrocarbon Management Plan).
- Good housekeeping practices must be employed in terms of the management of hazardous substances, and general and hazardous waste throughout decommissioning; all rubble and materials must be removed from the site.
- All dirty water must be removed from the dirty water management system before dismantling.
- The PCD and RWD are to remain on site.
- Soil quality assessments must be carried out at decommissioning to verify that the soil is not contaminated before re-spreading the soil for rehabilitation. This assessment must entail a thorough site inspection, soil sampling, as well as soil chemical analyses for heavy metals and other routine parameters such as pH, EC etc. in order to compare with the analysis results from the baseline assessment, which were determined prior to the proposed development. This will clarify if further analyses need to be carried out, especially if any visual stains or hydrocarbon odours are observed during the inspection.

2.4.3 Soil quality, fertility and land capability

The rehabilitation of the Class II (Avalon and Westleigh soil forms, sandy yellow) arable (cultivation) land use areas may be moderately limited by:

- Gentle slopes;
- Moderate susceptibility to wind and water erosion;
- Less than ideal soil depth;
- Somewhat unfavourable soil structure and workability; and
- Slight climatic limitations on soil use and management.

The rehabilitation of the Class III (Westleigh soil form, sandy yellow) arable (cultivation) land use area may be severely limited by:

- Moderately steep slopes;
- High susceptibility to water or wind erosion or severe adverse effects of past erosion;

- Frequent flooding accompanied by some crop damage;
- Very slow permeability of the subsoil;
- Wetness or some continuing waterlogging after drainage;
- Shallow soil depth to bedrock, hardpan, fragipan or clay pan that limit the rooting zone and the water storage;
- Low water-holding capacity;
- Low fertility not easily corrected; and
- Moderate climatic limitations.

The rehabilitation of the Class V (Valsrivier soil form, clayey) grazing land use area may be limited by:

- Valley bottoms subject to frequent flooding that prevents the normal production of cultivated crops;
- Nearly level land with a growing season that prevents the normal production of cultivated crops;
- Level or nearly level stony or rocky land;
- Ponded areas where drainage for cultivated crops is not feasible but which are suitable for grasses or trees;
- Class VI include permanent waterlogged Ka soils in low lying wetland areas.

Ineffective rehabilitation could have a negative impact on soil quality and fertility, subsequently affecting the future land capability. The impact of stockpiling on soil quality and fertility is considered to be of **medium** significance prior to the implementation of the mitigation measures listed below, but can be reduced to **low** with their implementation (refer to Table 3).

Mitigation Measures

When stockpiled soils have been replaced during rehabilitation, the soil fertility must be assessed to determine the level of fertilisation required to sustain normal plant growth (refer to Soil Management Plan in Section 3 below).

Table 3: Decommissioning Phase Ratings

PROCESS	IMPACT	MAGNITUDE (M)	DURATION (D)	SCALE (S)	PROBABILITY (P)	SIGNIFICANCE	
						RATING	VALUE
▪ Removing of surface infrastructure and access roads etc. ▪ Excessive stormwater run-off from newly rehabilitated areas, which have not yet been vegetated or where vegetation has not re-established	Increase in soil erosion	8 [4]	5 [5]	1 [1]	4 [2]	Medium [Low]	56 [20]

PROCESS	IMPACT	MAGNITUDE (M)	DURATION (D)	SCALE (S)	PROBABILITY (P)	SIGNIFICANCE	
						RATING	VALUE
▪ Heavy vehicles and earth moving machinery on site ▪ Potential hydrocarbon leaks	Soil contamination	8 [6]	2 [2]	1 [1]	4 [3]	Medium [Low]	44 [27]
▪ Compaction ▪ Ineffective rehabilitation	Reduced soil quality, fertility and future land capability	8 [6]	5 [5]	1 [1]	4 [2]	Medium [Low]	56 [24]

2.5 Post-Closure Phase

2.5.1 Erosion

Excessive stormwater run-off from areas where vegetation has not re-established may result in erosion. The impact of the potential increase in erosion is considered to be of **medium** significance prior to and **low** significance after the implementation of the mitigation measures listed below (refer to Table 4).

Mitigation Measures

- If re-vegetation is slow an appropriate fertilizer programme must be implemented and unhealthy or dead plant material must be replaced.
- Erosion-sensitive areas must be monitored and any damage caused by erosion must be repaired.

2.5.2 Permanent loss of mixed arable and grazing land

Soil capability and therefore land capability and suitability of reclaimed land is generally degraded from arable pre-mining natural capabilities to man-made post-mining mainly grazing land capabilities needing special management and care. More important than chemical imbalances which can be easily restored at cost, is soil compaction and volumes of replacement during soil reclamation. Heavy mining equipment is used during soil reclamation and soil is compacted beyond agricultural reclamation leaving behind areas of low soil and land capabilities. Such areas have limited land use options but specialized management needs.

After closure the shafts will be sealed and the WRD, pollution control facilities and TSF will remain on site. The agricultural potential of the land at the sealed shafts, WRD and pollution control facilities, and the grazing land at the TSF, will be permanently lost. The potential impact is irreversible. The impact of the loss of arable agriculture and grazing land is considered to be of **high** significance and the potential impact cannot be mitigated (refer to Table 4).

Table 4: Post-Closure Phase Ratings

PROCESS	IMPACT	MAGNITUDE (M)	DURATION (D)	SCALE (S)	PROBABILITY (P)	SIGNIFICANCE	
						RATING	VALUE
▪ Increased stormwater run-off if re-establishment of vegetation is slow	Increase in soil erosion	8 [4]	5 [5]	1 [1]	4 [2]	Medium [Low]	56 [20]
▪ Sealing of shafts ▪ WRD, pollution control facilities to remain on site	Permanent loss of arable agriculture land	8	5	1	5	High	70
Established TSF to remain on site	Permanent loss of grazing land	6	5	1	5	High	60

2.6 Cumulative Impacts

Presently the arable soils within the project area have good soil fertility due to fertilization and have been farmed for a long time. The proposed project will have minimal cumulative impacts, but the following impacts may occur:

- Soils in the area may currently be slightly compacted and further compaction will occur as a result of heavy vehicles and heavy earthmoving machinery on site.
- Compaction also results in aggravation of run-off erosion as compaction reduces the water infiltration rate.
- The loss of arable agriculture land due to the change of land use from agriculture/ grazing to industrial within the planned development areas and the potential loss of soil quality, fertility and land capability due to ineffective stockpile management and rehabilitation will have a cumulative impact (and limiting effect) on the end land use.

3 SOIL MANAGEMENT PLAN

MANAGEMENT MEASURE REF NO.	ASPECT	MANAGEMENT MEASURE	RESPONSIBLE PARTY
Construction and Operation Phase			
SM 1	Stripping	• Vegetation and soil must be retained in position for as long as possible, and removed immediately ahead of construction / earthworks in that area to avoid erosion.	ECO / Construction manager
SM 2		• Topsoil within the uncultivated grazing area is approximately 30 cm deep. • Topsoil within the cultivated area is approximately 50 – 80 cm deep. • Topsoil and subsoil should be stripped prior to excavation and construction. The infrastructure areas that need to be stripped are the TSF, the processing plant and WRD. • Each soil type and soil horizon should be stripped and stored separately. • Soils should be stripped and placed when dry as handling of wet soils increases the compaction/ loss of soil structure. • Stripping by means of excavator buckets, and loading on dump trucks, is preferable to stripping and loading by means of bowl-scrapers. • Topsoil and subsoil stripping and stockpiling for future rehabilitation purposes must be conducted correctly under qualified supervision.	ECO / Construction manager
SM 3	Stockpiling	• Soils should be stockpiled preferably according to soil type and natural horizon sequence (Dark clayey soil should not be mixed with the yellow and red topsoil). • The topsoil / subsoil stockpiles should be relocated to a free draining, flat area where erosion and contamination of the stockpile will not occur. • Live management and placement of topsoil should be implemented where possible to improve the organic content of the soils. Fertility levels must be maintained through fertilisation and to curb topsoil loss as much as possible.	ECO / Construction manager
SM 4		• The height of the topsoil stockpiles should be restricted to 4 m. • Other soil storage stockpiles should be restricted where possible to heights of less than 4-5 m so as to avoid damage to the soil seed bank.	ECO / Construction manager
SM 5		• The stockpile side slopes should be stabilised at a slope of 1:6. This will promote vegetation growth and	ECO / Construction manager

MANAGEMENT MEASURE REF NO.	ASPECT	MANAGEMENT MEASURE	RESPONSIBLE PARTY
		reduce run-off related erosion. Locally adapted perennial or annual seed mixtures of grasses should be used for rehabilitation.	
SM 6		• Once stockpiled, indigenous grass cover should be implemented (either through natural propagation if the seed bank is sufficient or through seeding) as soon as possible and should remain covered until required for rehabilitation.	ECO / Construction manager
SM 7		• Equipment, human and animal movement on the soil stockpiles should be limited to avoid compaction and soil damage to the soils and seed bank.	ECO / Construction/ Site manager
SM 8	Contamination	• If soil is contaminated, measures as described in the Hydrocarbon Management Plan must be implemented. • The first management priority is to treat the pollution by means of *in situ* bioremediation. The acceptability of this option must be verified by an appropriate soils expert on a case by case basis, before it is implemented. If remediation is not possible, the contaminated soil should be excavated and removed from site, handled accordingly and discarded as potentially hazardous waste. • Annual soil contamination assessments should be carried out as per the Soil Monitoring Programme.	ECO
SM 9		• Stormwater management measures must be put in place according to the Water Management Plan to attenuate stormwater volumes and decrease velocity.	ECO / Construction manager
SM 10	Erosion	• Exposed (bare) areas should be stabilized with vegetation and/or erosion control blankets. Establishing and maintaining vegetation as a soil cover is the most common practical technique for controlling erosion on disturbed soils. Water flow inhibiting grasses such as Vetiver or biodegradable Jute mesh erosion control blanket should be established on undeveloped (open) areas and along the lower ends of the site, in order to retard overland water flow and erosion. These are suitable for short to medium term erosion protection. The effect of the Jute mesh can be enhanced by putting it over a loose blanket of thatching grass or reeds, if locally available. A 70 % dead grass or reed cover will slow down flow, minimise wind erosion and suppress weed growth. The open weave nature of the Jute mesh blankets helps retard water flow velocity, while allowing sunlight infiltration to encourage vegetation growth. Alternatively, strips of instant turf can be planted a few meters apart during spring or late summer, with tuft runner grasses in between.	ECO / Construction/ Site manager
SM 11		• Erosion control of all banks, including the existing eroded drainage channels, must take place so as to reduce erosion and sedimentation. Eroding embankments need to be sloped to a gradient of not more	ECO / Construction/ Site manager

MANAGEMENT MEASURE REF NO.	ASPECT	MANAGEMENT MEASURE	RESPONSIBLE PARTY
		than 1:3 and appropriately re-vegetated. Cleared bush and brush can be used for backfill in the existing eroded drainage channels.	
SM 12		• All areas susceptible to erosion (including roads, bare areas and drainage channels) must be monitored as per the Soil Monitoring Programme.	ECO / Construction/ Site manager
SM 13	Soil fertility	• Areas where vegetation has not been cleared within the surface infrastructure area should be mowed.	ECO / Site manager
Decommissioning Phase			
SM 14	Sampling	• A representative sample of the stockpiled soils must be analysed prior to rehabilitation as per the Soil Monitoring Programme.	ECO / Suitably qualified service provider
SM 15	Rehabilitation	• Stockpiled soil should be used to rehabilitate disturbed sites. The utilisable soil removed during the construction phase, must be redistributed in a manner that achieves an approximate uniform stable thickness consistent with the approved post development end land use, and will attain a free draining surface profile. A minimum layer of 30 cm of topsoil should be replaced over the project area to return the area to a grazing post mining land use.	ECO / Site manager
SM 16		• Soil contaminated with hydrocarbons must be removed to an allocated area where it will be rehabilitated and soil that cannot be rehabilitated must be disposed of at an appropriate landfill facility.	Suitably qualified service provider
SM 17		• The fertility remediation requirements need to be verified at the time of rehabilitation, and informed by the results of sampling. Input from a soil specialist should be obtained regarding fertility remediation requirements, which should be adhered to prior to re-vegetation. The chemical soil composition should be ameliorated to closely match the baseline values as far as possible, particularly for pH and EC.	ECO/ Suitably qualified service provider
SM 18		• Rehabilitated areas should be cordoned off to limit equipment, human and animal movement on the rehabilitated areas.	ECO / Site manager
SM 19	Re-vegetation	• Re-vegetation must be carried out according to the Closure Plan and must include the implementation of soil saver and proper establishment of vegetation cover on the TSF.	ECO/ Botanist
Post- Closure Phase			
SM 20	Monitoring and maintenance	• Alien invasive plant species monitoring and eradication for two years post-closure. • Vegetation rehabilitation monitoring must take place seasonally during the summer months for two years post-closure according to the Terrestrial Ecology (Flora) Monitoring Programme. • All areas susceptible to erosion must be monitored as per the Soil Monitoring Programme.	ECO / Botanist/ Site manager

4 SOIL MONITORING PROGRAMME

4.1 Aim

The aim of this soil monitoring programme is to:

- Aid in the assessment of the effectiveness of the soil management measures;
- Monitor soil quality and erosion;
- Ensure timely actions are taken to eliminate or control the sources of soil contamination and prevent or reduce the risk of contaminant transfer from impacted soils to other environmental media (air or water) or potential receptors; and
- Ensure that there is no undue soil erosion resultant from activities. If erosion is identified it must not be allowed to develop on a large scale before effecting repairs.

4.2 Monitoring Sites

Soil contamination monitoring must be undertaken at the proposed soil monitoring locations (see Table 5 and Figure 4 below) and all areas susceptible to soil erosion must also be monitored.

Table 5: Proposed Soil Monitoring Locations

Monitoring Point	Description	Longitude	Latitude
1	West of topsoil stockpiles	27°3'36.983"E	28°2'36.907"S
2	North of TSF	27°3'57.815"E	28°2'52.182"S
3	South of TSF	27°3'32.434"E	28°3'16.749"S
4	Between TSF and WRD	27°3'17.754"E	28°3'1.697"S
5	Near plant	27°3'6.997"E	28°2'41.34"S
6	North west boundary	27°2'54.171"E	28°2'12.355"S

4.3 Reporting

- During operations, all areas susceptible to soil erosion must be monitored on a monthly basis. Photographs of areas of concern should be taken and kept on record. Repair, maintenance and prevention measures must be implemented if erosion is noted.
- Soil contamination monitoring should be reported on annually during operations and reports must be submitted to the Environmental Officer. Soil analyses for pH, EC and the metals, metalloids, hydrocarbons and anions listed in in terms of the "Soil Screening Values from GNR 331 of 2014 National Norms and Standards for the Remediation of Contaminated Land and Soil Quality" should be carried out.
- If the soil contamination investigation indicates that soil is contaminated, the first management priority is to treat the contamination by means of *in situ* bioremediation. The acceptability of this option must be verified by an appropriate soil specialist and by the Department of Water and Sanitation (DWS) on a case by case basis, before implementation.
- If *in situ* treatment is not possible or acceptable then the contaminated soil must be assessed according to legislation (currently the Norms and Standards for the Assessment of

Waste for Landfill Disposal, GNR635 of 2013) and disposed of at an appropriate licensed landfill facility.

- The proposed Soil Monitoring locations to be reported on are identified in Figure 4 below, but must also include any additional sites that may be reported as being affected by the operations (either via contamination, erosion, compaction, etc.).
- A report must be prepared after each monitoring survey. This report must be based on the findings at the proposed monitoring points. The report must be submitted to management to ascertain compliance with the required standards at sensitive receptors.
- An annual report (including photographs and recommended management if required) must be made available incorporating the monitoring results. Trends must be identified and mitigation measures recommended where necessary.
- Preliminary soil fertility monitoring on stockpiled topsoil should be carried out, prior to rehabilitation. A representative sample of the stockpiled soils must be analysed to determine the nutrient status and chemistry of the utilisable materials. As a minimum the following elements must be tested for: EC, CEC, pH, Ca, Mg, K, Na, P, Zn, Clay% and Organic Carbon.
- After closure, all areas susceptible to erosion must be monitored annually and repair, maintenance and prevention measures implemented (if erosion is noted) until a closure certificate is issued.

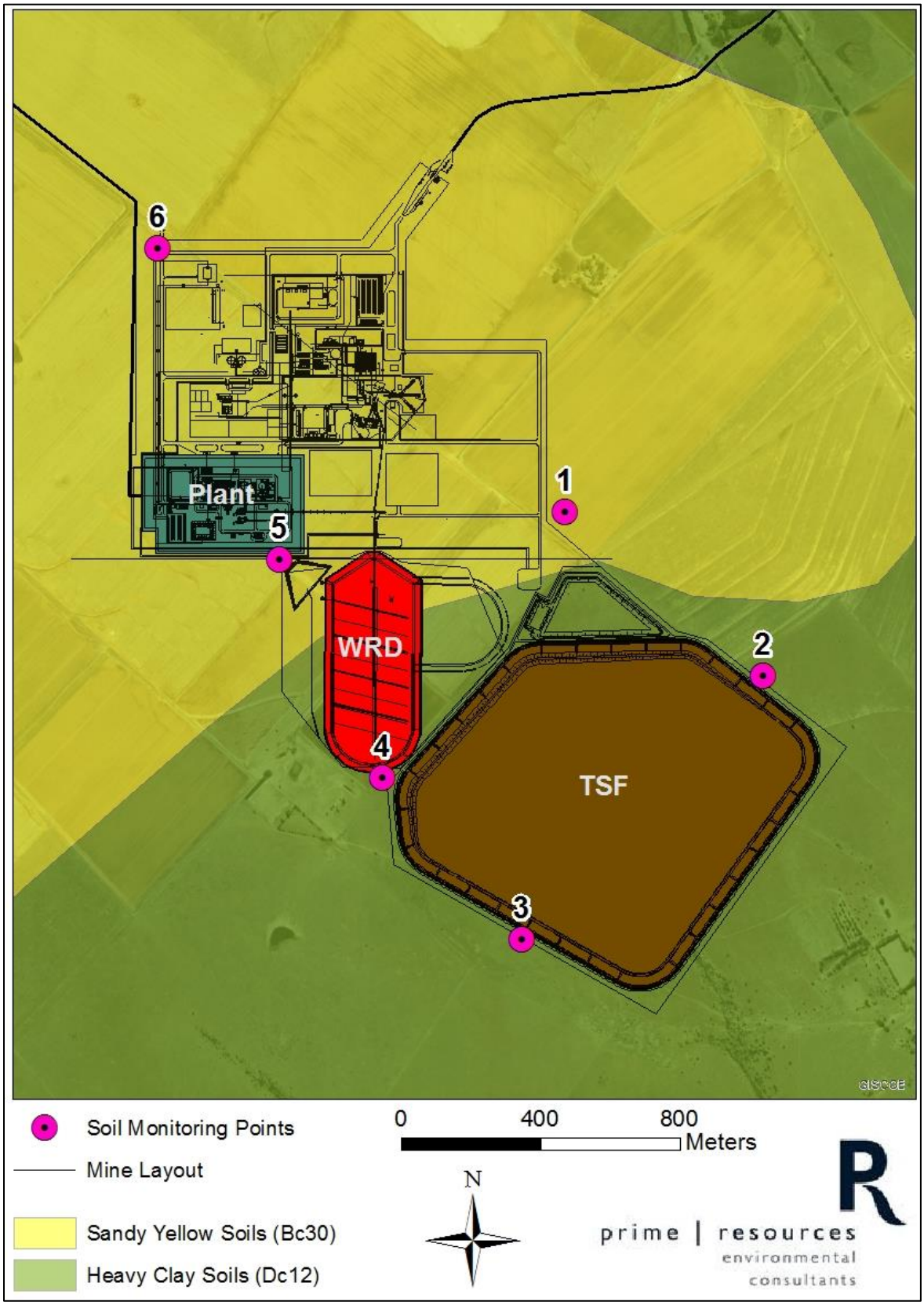

Figure 4: Proposed Soil Monitoring Locations

5 CONCLUSIONS

A variety of soil types were identified for the project area. The soils can be grouped into two groups namely heavy clay soils occupying areas dominated by grazing and sandy yellow soils occupying areas dominated by arable agriculture. The land capability of the project area can be classified as mixed arable and grazing. The agricultural potential of the deep red and yellow soil is high while the agricultural potential of the heavy clay soil is low.

The underground mining operation will not impact directly on the soil, land capability and land use during underground mining. However, the above ground infrastructure will have an impact on erosion, contamination and land capability. There will be a permanent loss of approximately 120 ha of the heavy clay soils where grazing currently takes place as a result of the areas to be covered permanently by the WRD and TSF. The land use in this area will change from agriculture (grazing) to industrial. The high agricultural potential yellow soil (approximately 119 ha) will be lost and the land use in this area will change from arable agriculture to grazing. Implementation of the management and monitoring measures is recommended in order to attain a post mining land use of grazing for the project area.

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APPENDIX 15

SOCIO-ECONOMIC STUDY (2013)

SOCIO-ECONOMIC BASELINE ASSESSMENT FOR A FEASIBILITY STUDY FOR THE PROPOSED VENTERSBURG MINE

GOLD ONE AFRICA LIMITED

APRIL 2013

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Report Title: **SOCIO-ECONOMIC BASELINE ASSESSMENT FOR A FEASIBILITY STUDY FOR THE PROPOSED VENTERSBURG MINE**

Project Number: **GOL1675**

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LIST OF ABBREVIATIONS

BFS	Bankable-feasibility study
CUT	Central University of Technology
DM	District Municipality
Gold One	Gold One Africa Limited
IDP	Integrated Development Plan
IFC	International Finance Corporation
LM	Local municipality
MPRDA	Mineral and Petroleum Resources Development Act, 2002
NCDs	Non-communicable Diseases
NEMA	National Environmental Management Act, 1998
PFS	Pre-feasibility study
PS	Performance Standards
RAP	Resettlement Action Plan
SAP	South African Police
SIA	Social Impact Assessment
SLP	Social and Labour Plan
SMME	Small Medium and Micro Enterprises
StatsSA	Statistics South Africa
STDs	Sexually Transmitted Diseases
TB	Tuberculosis

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1 INTRODUCTION

Gold One Africa Limited (Gold One) was granted a Prospecting Right to prospect for gold in the Free State gold fields, close to Ventersburg, a farming town approximately 40 km south-east of Welkom. This Prospecting Right initiated the Proposed Ventersburg Mine, which is currently exploring the geological resource base within the Prospecting Right area.

Digby Wells Environmental (Digby Wells) was contracted by Gold One to undertake specialist studies for the Bankable Feasibility Study (BFS) and various regulatory processes and baseline studies for the proposed Gold One Ventersburg underground gold mine. The proposed project will involve underground mining, including a shaft, a rock dump, a processing plant, and Tailings Storage Facility (TSF).

The socio-economic baseline study is one of the several baseline studies and the results of which are presented in this report. This document is intended to form part of a multi-disciplinary specialist baseline included in the BFS, and not to be a standalone document. Its purpose is to provide insight into the social environment upon which the proposed project will impact by considering the following:

- Legislation and development policies relevant to the proposed project;
- The current socio-economic conditions in the study area;
- Potential socio-economic impacts that might be imposed by the proposed project; and
- Risks and constraints that can inform project planning.

The remainder of this document is structured as follows:

- The approach and methodology employed in order to produce this document is presented in Section 2;
- Section 3 provides further details regarding the proposed project;
- Legislation and development policies relevant to the proposed project are listed in Section 4;
- The affected social environment is described in Section 5;
- Potential impacts and risks are discussed in Section 6; and
- The way forward is suggested in Section 7.

2 METHODOLOGY

In order to achieve the purpose of this study (as set out in Section 1), a number of activities were undertaken. These activities are discussed in turn below.

2.1 Definition of the study area

Although this report is intended to inform a feasibility study to be conducted by other consultants, its content will likely form the basis for predicting future impacts of the project. Therefore, the study areas defined must be useful for the impact assessment phase. The study area for an impact assessment can be defined as the area that is likely to experience impacts arising from or exert influence on, the project or activity being assessed (IFC, 2003). In the case of socio-economic impact assessment, this task is complicated by the fact that different types of socio-economic impacts make themselves felt over different geographical areas. Generally such impacts of a project can be divided into three broad categories:

- Impacts related to the ***physical intrusion*** of project infrastructure and project-related activities on the surrounding environment (which may include socio-economic impacts arising from land acquisition, noise, dust, vibration and changes in the visual characteristics of the landscape);
- Impacts related to the ***"economic pull"*** exerted by the project (including job creation, an influx of workers and job-seekers into the project area, as well as the concomitant risk of increased social pathologies and community conflict); and
- ***Indirect or induced impacts*** that are by-products or ripple-effects of the impacts in the foregoing two categories. These could include increased pressure on local services and resources (as a result of the population influx), multiplier effects in the local and regional economy (as a result of the creation of new jobs and project-related expenditure), macroeconomic benefits of the project and benefits derived from corporate social investment by the project proponent.

Accordingly, three concentric study areas have been defined for the purposes of this document, corresponding to the three categories of impacts listed above. These study areas are defined below; each one encompasses its predecessor and exceeds it in scale:

- The ***site-specific study area*** – the area likely to experience impacts related to the ***physical intrusion*** of project infrastructure and project-related activities. It includes the Prospecting Right area and the immediately surrounding area – in particular, the township of Phomolong, Vogel's commercial farm, and the Hennenman and Whites communities.
- The ***local study area*** – the area likely to experience impacts related to the ***"economic pull"*** exerted by the project. This area encompasses the municipal wards upon which the proposed project site is located, namely ***Wards 2 and 3*** of Matjhabeng Local Municipality (See Section 5.1)

- The ***regional study area*** – the area likely to experience ***indirect or induced impacts*** of the project. This area encompasses the whole of ***Matjhabeng Local Municipality*** (See Section 5.1).

2.2 Data Collection

The information presented in this document is based on several data collection activities, each of which is described below.

2.2.1 Desktop review

A review of available documents was undertaken to obtain information regarding the baseline socio-economic conditions in the potentially affected areas. Documents reviewed include the following:

- Integrated Development Plans (IDPs) of local and district municipalities;
- Socio-economic and demographic statistics (sourced from Statistics South Africa's 2001 Census data, and the 2007 Community Survey);
- Other relevant literature that enhanced the specialists' understanding of the social factors that come into play during a project such as the one under consideration; and
- Available maps and aerial or satellite imagery.

2.2.2 Site Visit

A site visit to the proposed project area was undertaken from 18 to 20 September 2012. The aim of this visit was to:

- Verify the information obtained through the desktop review;
- Where appropriate, augment this information through direct observation;
- Conduct interviews and focus groups with a selection of key informants. These key informants (listed in Table 1) were selected on the grounds that, due to the nature of their occupations, they are likely to possess wide-ranging knowledge of social dynamics and economic conditions in (especially the local) study area. Refer to Section 2.5 for more detail on the selection of key informants. The objectives of the focus groups and interviews were to:
  - Obtain supplementary information about socio-economic conditions in the project area;
  - Gain insight into the way that the socio-economic environment is likely to be affected by the proposed project; and
  - Identify any potential social risks that may jeopardise the successful implementation of the project.

Table 1: Focus groups and interviews

Date	Group/Organisation	Representative/Respondents
2012/09/18	Municipal Ward 3 – Matjhabeng Local Municipality	Ward councillor and ward committee
	Phomolong community	Residents from Ward 3
	Municipal Ward 2 – Matjhabeng Local Municipality	Ward councillor, ward committee and residents
	Hennenman Police Station	SAP representatives
2012/09/19	Kheleng Secondary School	Mr Mosia (Principal)
	Kwatsa Primary School	Mr R D Mohohlo (Vice Principal)
	Phomolong Clinic	Mr J Rantsi (Clinic Manager)
2012/09/20	Landowner	Mr Vogel
	Other affected residents	Farm workers residing on the landowner's property
	Phomolong Businesses	Business owners

Figure 1: Interview with SAP representatives

2.3 Compilation of a socio-economic baseline

A socio-economic baseline profile was compiled on the basis of the information derived from the aforementioned data collection activities. The objective of the baseline profile is to provide a concise review of the regional, local and site-specific socio-economic contexts in which the proposed project is to be situated.

2.4 Identification of potential socio-economic impacts and risks

The information presented throughout this document informed the identification of several potential socio-economic impacts that will warrant special consideration during the impact assessment phase of the project, should it continue past the feasibility stage.

Based on the baseline profile and potential impacts a number of socio-economic risks that could have negative spin-offs for the proposed project were identified. These may constitute constraints that would have to be accommodated in project design, or issues that would require appropriate management and mitigation. The potential impacts and risks are discussed in Section 6 of this report.

2.5 Limitations of the assessment

The social component of this assessment is subject to the following limitations:

- Limited effort has been made to establish communication channels with key stakeholders or affected parties. Such a step was deemed premature at this stage of investigations, as it is not yet certain that the proposed project will be implemented, and announcing the project may therefore create undue expectations and concerns.
- Since the latest census results are not yet known on a ward level, statistics derived from the previous census undertaken in 2001 and 2007 were used; it is possible that these statistics have not been able to capture the temporary increases in local population trends in the area.
- At the time of writing this report, certain aspects of the gold project's planning (e.g. detailed planning of ancillary infrastructure) had not yet been completed. This is the result of an inevitable trade-off in environmental and social assessment. On the one hand, it is advisable to conduct environmental and social assessment early in the project planning cycle so that significant negative impacts and potential fatal flaws can be identified and plans modified to avoid or reduce them. On the other hand, the very fluidity of designs at this early stage of planning that makes it possible to modify them in the light of stakeholder inputs and the outcomes of impact assessment often imposes limitations on the degree of certainty that can be attached to predictions of impacts. Such uncertainty is, however, considered to be preferable to a situation in which substantial impacts or sensitivities in the social or biophysical environment are only identified after the mine plans are in an advanced stage of development and can only be changed with considerable difficulty.

3 PROJECT DESCRIPTION

This chapter provides basic information pertaining to the proposed project, focussing partly on those aspects specific to the social context of the project. It commences with a brief description of the project's location, project infrastructure and current activities onsite. This is followed by details regarding employment requirements and policies. This information is important for the identification of social impacts of the project that are discussed later in the report.

3.1.1 Project location

The proposed project is located in the central region of the Free State province, approximately 150km north-west of Bloemfontein, in between the towns of Hennenman and Ventersburg. Administratively the proposed project site falls within the Lejweleputswa District Municipality (DM), which is one of four district municipalities in the province. More specifically the project is located within Ward 2 and 3 of Matjhabeng Local Municipality (LM). This municipality is bordered by Moqhaka LM to the north and east, Sesoto LM to the south east, Masilonyana LM to the south west and Tswelopele and Nala LM to the west and northwest (see Figure 2).

Figure 2

Ventersburg Gold ESIA

Project Location

Legend

- Project Area
- City
- Major Town
- Secondary Town
- Other Town
- Settlement
- Roads
- Local Municipal Boundary
- Matjhabeng Local Municipality

DIGBY WELLS ENVIRONMENTAL

www.digbywells.com

Projection: Transverse Mercator
Datum: Hartebeeshoek 1994
Central Meridian: 27°E

Ref #: tdm.GOL1675.201211.114
Revision Number: 1
Date: 19/11/2012

N

0 5 10 20 30

Kilometres

1:700 000

The property, on which the proposed operation is to be located, is situated just more than 500m south west of Phomolong Township; the R70 roadway which interconnects Hennenman and Ventersburg intersects between the proposed project area and Phomolong. The project footprint comprises an area of approximately 2000 hectares and overlaps with several farm portions, which are mostly used for commercial agriculture and livestock breeding. Affected farm portions include:

- The remainder of the farm La Rochelle 760.
- Portion 1 of the farm La Rochelle 760.
- The remainder of the farm Klippan 72.
- Portion 1 of the farm Klippan 72.
- A portion of Portion 2 of the farm Klippan 72.
- A portion of Portion 3 of the farm Klippan 72.
- A portion of the remainder of the farm Vogels Rand 720.
- Portion 1 of the farm Vogels Rand 720.
- A certain portion of the Remainder of the farm Whites 747
- The remainder of Portion 1 of the farm Whites 747
- Portion 3 of the farm Whites 747
- A portion of Portion 1 of the farm Ida 62
- A portion of portion 1 of the farm Ballyedikin 33
- A portion of the remainder of the farm Lewenslus 753
- A portion of Portion 1 of the farm Lewenslus 753
- The remainder of the farm Hans Verwacht 337
- Portion 1 of the Hans Verwacht 337
- The remainder of the farm Sameleven 408
- Portion 1 of the farm Sameleven 408
- The remainder of the farm Onverwacht 342
- The reminder of the farm Flippe 738
- Portion 1 of the farm Flippe 738
- A portion of Portion 1 of the farm Boyden 603
- A portion of the remainder of the farm Barbiena 398
- A portion of the remainder of Portion 1 of the farm Barbiena 398
- A portion of Portion 3 of the farm Barbiena 398

- Portion 4 of the farm Barbiena 398

3.1.2 Project infrastructure

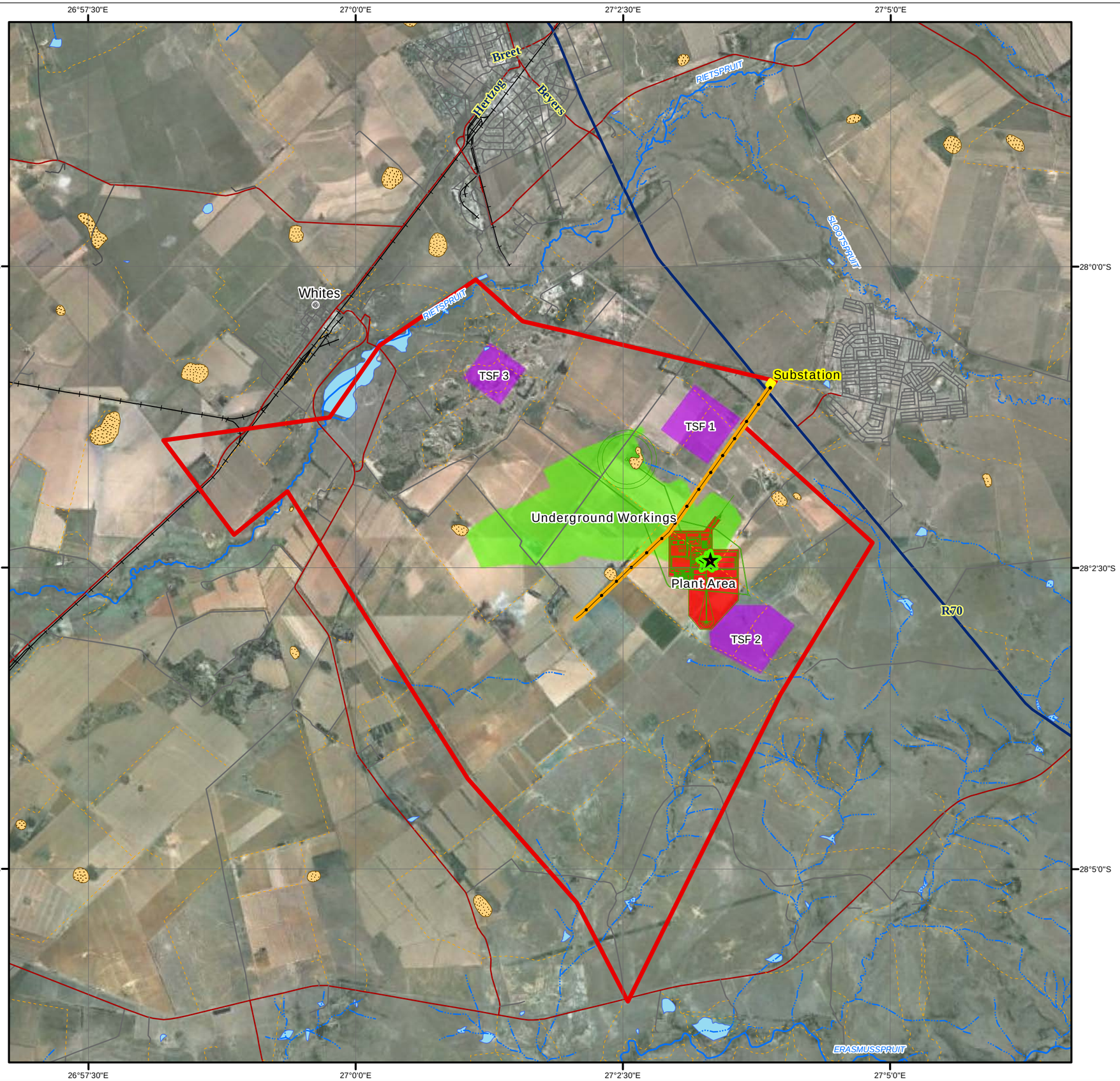
The proposed project will be an underground gold mine. It is envisaged that the ore extracted from the mine will be processed at an on-site processing plant, which implies that ancillary infrastructure necessary for processing the gold will also be located onsite. Preliminary mine plans (see Figure 3) show that infrastructure to be constructed on site will include the following:

- Gold processing plant;
- Vertical access shaft;
- Ventilation shafts;
- Tailings storage facilities;
- Waste rock dump;
- Internal haul roads; and
- Supporting services infrastructure (access roads, offices, parking, etc.).

Figure 3

Ventersburg Gold ESIA

Infrastructure



Legend

- Project Area
- Arterial / National Route
- Main Road
- Minor Road
- Tracks
- Railway Line
- Power Line
- Perennial Stream
- Non-Perennial Stream
- Dam / Lake
- Non-Perennial Pan
- Perennial Pan

Infrastructure

- Shafts
- Site Layout
- Plant Area
- Tailings
- Underground Workings
- Powerline Servitude
- Substation

DIGBY WELLS ENVIRONMENTAL

www.digbywells.com

Projection: Transverse Mercator
Datum: Hartebeehoek1984
Central Meridian: 27°E

Ref #: tdm.GOL1675.201210.242
Revision Number: 1
Date: 31/10/2012

N

0 1.5 3

Kilometres

1:60 000

3.1.3 Project activities

The project is currently in its prospecting phase. Diamond core drilling is underway at a number of locations within the mining right area (see Figure 4). The purpose of this is to delineate the shallow (less than 300m below surface) south-eastern limit of the ore body as well as the eastern limit of the modelled higher grade pay shoot area. This will allow the proponent to simulate the results that could be achieved during underground mining more accurately. Construction and operational activities are planned after the sampling process, however, the execution and timing of these activities will depend on the conclusion of the BFS.

The mine has an anticipated life-span of 17 years. It is envisaged that the construction of the mine will be completed within four years and that it will operate for a total of 13 years thereafter. It is anticipated that construction activities will ramp up at the start of this period and slope down again towards the end. The period of peak activity will last about 2-3 years, during which the employment and procurement requirements will also peak.

Figure 4: Prospecting drilling

3.1.4 Project employment

This section elaborates on the employment requirements projected by the mine, as well as Gold One's recruitment and procurement policies and the implications thereof. The inclusion of this information in the project description is motivated by the fact that local job creation constitutes one of the most significant positive socio-economic impacts of the proposed project. Accurate assessment of this impact therefore requires a combination of two types of information:

- Information on the required workforce of the project; and

- Information on the size of the local labour force, availability of skills and other attributes of the surrounding area that would influence the degree to which available employment opportunities could be taken up by local persons.

Gold One's recruitment policy is based on the South African Mining Charter, which dictates that at least a certain proportion of a mining operation's employees should be recruited from historically disadvantage communities and where necessary, receive appropriate skills training. Employees recruited from local communities should also represent vulnerable groups such as females and people with disabilities. It is Gold One's intention to achieve at least 10% representation of women in the workplace.

The employment requirements during the different project phases are set out in Table 2 below. Table 2 shows that semi-skilled employees will likely be recruited from local labour sending areas[1], provided that people in these areas have the required skills.

Table 2: Employment requirements[2]

Phases	Total	Skills level[3]	From the local area	From outside the local area*
Construction	300 - 400	A	100%	-
		B to D	20%	80%
Operation	1700 - 2000	A	100%	Only if skills are not available
		B to D	20%	80%
Closure	±50	More un-skilled labour required than during other phases.	Not available at this stage	

The size of the construction workforce during the peak construction period will be in the region of 400 people, depending on the labour intensity of construction activities (see Table 2). Several project components listed above (e.g. access road, earthworks, etc.) will involve construction activities that might require at least some labour-based works. These tasks could create the opportunity for making use of unskilled and semi-skilled individuals. Due to Gold One's policy of encouraging recruitment from historically disadvantage communities, it is anticipated that some of the workforce will be sourced from local labour sending areas. It

[1] Local Area - the gold mining areas in the proximity of Virginia, Welkom, Orkney, and Ventersburg.

[2] These numbers are not final, since the project is still in the feasibility phase.

[3] *Skill levels are defined by the Patterson grading system, which bases skill level on the type of decisions an employee is required to make on a day to day basis.* **Band A** – Unskilled workers (defined decisions); **Band B** - Semiskilled workers (automatic decisions); **Band C** - Skilled workers (routine decisions); **Band D** (interpretative decisions) – supervisory; **Band E** – Managerial (programming decisions); **Band F** – Executive management (policy making).

is likely that some employment opportunities will also be created for those living in Phomolong and its surroundings.

A proportion of the construction workforce will not be recruited from the local area, as they will be composed of the existing construction teams of the contractors appointed by Gold One. It is anticipated that contractors will bring their own workforce with them. A considerable percentage of these employees will not be permanent residents in the area. Consequently, additional accommodation will be required. Some of the non-local construction workers will be housed in a construction camp located in the area. Table 3 shows the type of construction teams and the number of workers that may reside in a construction camp. During the operational phase no construction camp will be required as employees will be expected to stay in neighbouring towns. Construction camps can have several negative socio-economic effects on local communities, hence the feasibility and location of such camps should receive special attention in future investigations.

Table 3: Contractor teams for construction

Activity	Workforce required	Stay on site
Shaft sinkers	150	Y
Road makers	No estimate	N
Builders	50	N
Plant construction	100	Y
Underground developer	No estimate	-
Fencing	No estimate	-
Water reticulation	No estimate	-
Other	No estimate	-
Total	300	N/A

4 LEGISLATIVE FRAMEWORK AND DEVELOPMENT POLICIES

This chapter is dedicated to the legislative framework relevant to the proposed project. It commences with a discussion of acts and policies that have bearing on mining projects. This is followed by a discussion regarding international best practice, including the relevant Performance Standards (PS) for environmental and social sustainability as set out by the International Finance Corporation (IFC).The chapter concludes with a summary of district and local socio-economic development plans.

4.1 Applicable national legislation

The following pieces of national legislation are relevant to the assessment and management of socio-economic impacts related to the proposed mining project:

- The ***National Environmental Management Act, 1998*** (Act No. 107 of 1998) (NEMA), which provides the legal framework for implementing the state's constitutional obligations with regard to environmental management. NEMA sets forth a number of principles for guiding decision-making on proposed activities that could affect the social, economic and biophysical environment. The following principles are relevant to a socio-economic impact assessment:
  - Decisions regarding a proposed activity should not only be based on their environmental impact and economic feasibility, but should also take into account their social sustainability;
  - Decisions must take into account the interests, needs and values of all interested and affected parties, and must recognise all forms of knowledge, including traditional and ordinary knowledge;
  - The social, economic and environmental impacts of activities, including disadvantages and benefits, must be considered, assessed and evaluated and decisions must be appropriate in the light of such considerations and assessment; and
  - Decisions must be taken in an open and transparent manner and access to information must be provided in accordance with the law.
- The ***Occupational Health and Safety Act, 1993*** (Act No. 85 of 1993) (OHSA): The objective of Act is to provide for the health and safety of persons at work. In addition, the Act requires that, as far as reasonably practicable, the employers must ensure that their activities do not expose *non-employees* to health hazards.
- The ***Mineral and Petroleum Resources Development Act, 2002*** (Act No. 28 of 2002) (MPRDA), which requires that mining companies assess the social impacts of their activities from start to closure, and beyond, and which also requires that mining companies compile and implement a Social and Labour Plan (SLP) to promote socio-economic development in their affected communities and to prevent or lessen negative social impacts.
- The ***Extension of Security of Tenure Act, 1997*** (Act No. 62 of 1997), which confers certain rights to non-landowning residents of a property, where such rights are linked to the period of time in which persons have been resident on the land.
- The ***Development Facilitation Act, 1995*** (Act No. 67 of 1995), which states that the principles, policies, administrative practice and laws should support effective integrated planning, the optimal use of existing resources, the promotion of sustainable development, and the requirement that land use should be judged on its merits.

4.2 International best practice

The most widely recognised and frequently applied set of best practice principles pertaining to the assessment and management of social and environmental impacts are the Performance Standards (PS) on Social and Environmental Sustainability, developed by the IFC in 2006 and updated in 2012. These standards will be valuable guidelines if the project moves past the BFS onto the impact assessment phase. The PS relevant to the proposed project are listed below. A brief explanation and the objectives of each, is also provided below (IFC, 2006).

4.2.1 Performance Standard 1: Social and Environmental Assessment and Management System

This PS emphasizes the importance of managing social and environmental performance throughout the life of the project, and is applicable to all projects with social and/ or environmental risks and impacts that should be managed both at the early stages of the project as well as on an on-going basis. Its objectives are:

- To identify and assess social and environmental impacts, both positive and negative, in the project's area of influence;
- To avoid, minimise, mitigate or compensate for adverse impacts on communities and the environment;
- To ensure that affected communities are appropriately engaged on issues that could potentially affect them; and
- To promote improved social and environmental performance of companies through the effective use of management systems.

4.2.2 Performance Standard 2: Labour and Working Conditions

This PS recognises that the pursuit of economic growth through employment creation and income generation should be balanced with protection for basic rights of workers. Its objectives are:

- To establish, maintain and improve the worker-management relationship;
- To promote the fair treatment, non-discrimination and equal opportunity of workers, and compliance with national labour and employment laws;
- To protect the workforce by addressing child and forced labour; and
- To promote safe and healthy working conditions, and to protect and promote the health of workers.

4.2.3 Performance Standard 3: Pollution Prevention and Abatement

This PS recognises that increased industrial activity and urbanisation often generate increased levels of pollution of air, water and land that may threaten people and the environment at a local, regional or global level. The objectives of this PS are:

- To avoid or minimise adverse impacts on human health and the environment by avoiding or minimising pollution from project activities; and
- To promote the reduction of emissions that contributes to climate change.

4.2.4 Performance Standard 4: Community Health, Safety and Security

This PS recognises that project activities, equipment and infrastructure often bring benefits to communities, including employment, services and opportunities for economic development. It also recognises, however, that development can increase the potential for community exposure to risks and impacts arising from equipment accidents, structural failures, and releases of dangerous materials. The objectives of this PS are:

- To avoid or minimise risks to and impacts on the health and safety of the local community during the project life cycle from both routine and non-routine circumstances; and
- To ensure that the safeguarding of personnel and property is carried out in a legitimate manner that avoids or minimises risks to the community's safety and security.

4.2.5 Performance Standard 5: Land Acquisition and Involuntary Resettlement

This PS refers both to physical displacement (the relocation or loss of shelter) and to economic displacement (loss of assets, or access to assets that results in the loss of income or means of livelihoods), and recognises that unless properly managed, involuntary resettlement may result in long-term hardship and impoverishment of affected persons and/ or communities.

National policies or legislation in southern Africa do not explicitly address involuntary resettlement. This policy vacuum is inadequately filled by complicated land tenure, environmental and planning legislation. Consequently the existing legal frameworks for addressing involuntary resettlement are inadequate and do not aid communities, implementing agents or mining companies. Instead they often obscure rights and responsibilities, cause unnecessary delays to resettlement projects and increase the total costs involved. In view of this gap in national legislation, resettlement processes in South Africa often follow the guiding principles set out in PS 5 which sets out the following objectives:

- To avoid or at least minimise involuntary resettlement wherever feasible by exploring alternative project designs;

- To mitigate adverse social and economic impacts from land acquisition or restrictions on affected persons' use of land by: (i) providing compensation for loss of assets at replacement cost; and (ii) ensuring that resettlement activities are implemented with appropriate disclosure of information, consultation, and the informed participation of those affected;
- To improve or at least restore the livelihoods and standards of living of displaced persons; and
- To improve living conditions among displaced persons through provision of adequate housing with security of tenure at resettlement sites.

4.2.6 Performance Standard 8: Cultural Heritage

This PS recognises the importance of cultural heritage for current and future generations, and its objectives are as follows:

- To protect cultural heritage from the adverse impacts of project activities and support its preservation; and
- To promote the equitable sharing of benefits from the use of cultural heritage in business activities.

(PS 6 (Biodiversity Conservation) and PS 7 (Indigenous People) have no application in this report)

4.3 Municipal development trajectory

Local economic development strategies highlight the socio-economic domains in need of improvement. These needs for development in local municipalities represent opportunities for proponents and other non-municipal or governmental institutions to contribute to the well-being of the municipality's population. An overview of the strategies relevant to socio-economic development within the study area is presented below.

4.3.1 District development

According to the Municipal Structures Act, district municipalities must strive to achieve integrated, sustainable and equitable socio-economic development within their administrative area. The most recent Integrated Development Plan (IDP) for Lejweleputswa District does not have specific policies and/or initiatives that target socio-economic development within their locality. The IDP does, however, contain several strategies and objectives that relate and contribute to the socio-economic development of the communities scattered throughout the district. These strategies and objectives are presented in Table 4 below.

Table 4: Objectives geared towards local economic development

Strategic focus area	Strategic objective
Poverty alleviation	Ensure absorption of identified indigents in community works programmes throughout the district municipality.
Cooperative development	Provide essential basic survival skills to targeting the unemployed to improve their standard of living
Business development	Support development of SMMEs in the region and increase the number of jobs created by these enterprises
Tourism development	Support all forms of tourism products to promote the region as a potential tourism destination by the end of 2017
Skills development	Create a skilled workforce to respond to specific needs of the mining and manufacturing businesses in the area through provision of bursaries.

4.3.2 Local development

This section provides an overview of Matjhabeng Local Municipality's development objectives, strategies, and programs, which are relevant to the socio-economic development of the population residing in the municipality.

4.3.2.1 Vision 2030

Vision 2030 is a statement that describes the strategic direction of a municipality's development plan. Logically, it is created to map out how the locality will reach its development vision and goals. According to the 2030 Vision set out for Matjhabeng LM the area should be well governed, developmental, and pro-poor in its nature and form. The municipality should be responsive to its citizens' concerns regarding safe water, health and air quality, as well as decent and sustainable human settlements. The municipality plans to improve service delivery by modernizing municipal administration, which will increase their efficiency. Matjhabeng also intends to eradicate and alleviate poverty by improving access to income-earning opportunities and social conditions of those living in peri-urban areas.

The municipality aims to be productive, balanced and characterized by shared development and growth. This will be achieved by efficient and effective utilization of land as well as focused investment on catalytic projects such as infrastructure and other major developments. In addition, the municipality will endeavour to unlock the economic potential in the primary, secondary and tertiary sectors. More specifically it will aim to improve its industrial and economic competitiveness together with assuring the sustainability of local businesses. To implement these ideals the municipality will focus on several development areas, which are discussed in turn below.

4.3.2.2 Economic development

According to its vision for 2030, the municipality intends to establish a competitive business environment that will be aligned with macro-economic development trends. More specifically Matjhabeng plans to promote infrastructure development in a manner that will not only support sustained economic growth but also preserve the environment. The municipality's ultimate goal is to create an environment in which economic activities can diversify and flourish. By achieving these objectives the municipality will indirectly address challenges in terms of job creation, stable incomes, wealth distribution, and inequality.

4.3.2.3 Development of Small Medium and Micro Enterprises (SMMEs)

SMME development has been recognized as a key economic opportunity within the locality. The Municipality identifies five core areas that need to be addressed in order to achieve viable and successful development within the small business sector. It aims to empower the future owners of business enterprises to:

- Be able to access helpful business support services;
- Be able to access work opportunities, be it through procurement opportunities or links with other big businesses (e.g. mining and infrastructure developments);
- Develop business assets and access to resources; and
- Develop skills in the domain of human resources, especially amongst the unemployed.

4.3.2.4 Tourism development

Tourism offers the opportunity to diversify economic activities and initiate development in rural areas, while allowing for the sustainable utilization of the natural environment. The tourism sector offers several potential employment multipliers within its supporting industries, such as financial services, construction, cleaning, security, laundry and catering. Tourism therefore has enormous potential to accelerate the growth of Matjhabeng's economy, and to create local jobs, particularly within the context of a declining mining sector in areas such as Welkom. With this in mind the municipality is placing a concerted focus on two niche tourism sub-sectors, namely mining and agricultural tourism.

4.3.2.4.1 Mining tourism

Many former mining areas have lost their industrial function and are turning to tourism for regional revitalization and the socio-economic development of surrounding communities. The transformation process of these industrial, and in some cases derelict, mining sites into an area of interest for tourists offers a unique opportunity to achieve sustainable economic growth and job creation. Both international and local tourists could be targeted to learn more about Matjhabeng's mining history through visiting mine museums (including underground museums), and taking guided mining tours. Mines that are no longer operational could therefore be leveraged in order to serve as income generating and job creating assets.

4.3.2.4.2 Agri-Tourism

In general, agri-tourism is the practice of attracting tourists or visitors to an area used primarily for agricultural purposes. Matjhabeng Municipality intends to develop agri-tourism as an economic sub-sector in its drive to diversify and grow its economy. This is due to its strong agricultural base. Agri-tourism provides the opportunity for a range of tourist activities to be developed, including, among other things, guesthouses, hiking trails and horse-back riding trails.

The development of agricultural and mining tourism would however require detailed planning and investment from the private sector.

4.3.2.5 Socio-economic development

Matjhabeng plans to develop an institutional framework to implement and coordinate special programmes focusing on the empowerment of the female, youth and the disabled segments of the community. This will be achieved through the following initiatives:

- Entrepreneurial support and skills development aimed at youth, women and people with disabilities;
- Learnership and internship programmes;
- Early childhood development campaigns;
- HIV/AIDS prevention programmes and awareness campaigns; and
- Programmes assisting vulnerable groups such as orphans and child headed-households.

Youth development is one of the key strategic priority areas of the Municipality. Issues of poverty and unemployment affect the youth in particular, which is why these problems remain central to the Municipality's developmental agenda. Key interventions in this regard include:

- Establishment of a youth unit;
- Providing support in hosting a youth summit;
- Review of youth policies to ensure that they promote youth development; and
- Increasing the number of youth participating in job creation and development.

5 DESCRIPTION OF THE RECEIVING ENVIRONMENT

The socio-economic baseline indicates the current social and economic status of the area that will be affected by mining activities. It describes the status quo at various geographic levels, ranging from the regional and local study areas (the municipality and potentially-affected wards, respectively, set against the backdrop of their district, provincial and national context) to the site-specific study area (as defined in Section 2.1 above).

5.1 Regional and local socio-economic environment

The following information was taken from secondary sources such as reports, websites, and census datasets.

5.1.1 Administrative structure

Situated in the Free State Province, Matjhabeng Local Municipality (LM) is one of five local municipalities that make up the Lejweleputswa District Municipality (DM). Other local municipalities in the area include Tokologo, Tswelopele, Nala and Masilonyana. Matjhabeng LM is located approximately 250km south of Johannesburg and 160km north of Bloemfontein.

Each local municipality is divided into wards and each ward has a councillor who is elected by people within the ward. It is the responsibility of the ward councillor to be a representative of the people within his or her ward. The project site falls within Wards 2 and 3.

Welkom is the urban centre of the local municipality. Other settlements are as follows:

- Ventersburg
- Hennenman
- Virginia
- Allanridge
- Odendaalsrus

5.1.2 Demographics

5.1.2.1 Population size

According to Table 5, Matjhabeng LM's population has declined the least (by 0.8%) when compared to the other municipalities within the Lejweleputswa DM. This decline in population could be caused by the retrenchment of mine workers. In contrast, the Masilonyana LM saw a 24% population increase. The average population increase in the province and the country between 2001 and 2007 was 8.2% (StatsSA, 2008).

Table 5: Municipal population distribution

Administrative area	Population		Change in population size (%)
	Census 2001	CS 2007	
Lejweleputswa DM	657 012	639 651	-2.6
Matjhabeng LM	408 170	405 031	-0.8
Nala LM	98 264	92 586	-5.8
Masilonyana LM	64 409	80 094	24.4
Tswelopele LM	53 714	40 617	-24.4
Tokologo LM	32 455	21 323	34.3

Source: StatsSA 2008

The racial demographic amongst the African population in each ward is fairly similar, with Ward 3 having a slightly smaller African component and a significantly larger White population than Ward 2 (Table 6).

Table 6: Population size by population group and ward

Population group	Ward 2	Ward 3
African	13 876	11 735
Coloured	64	77
Indian	0	9
White	15	2486
Total population	**13 955**	**14 307**

Source: StatsSA 2001

5.1.2.2 Population group and gender distribution

According to the Matjhabeng LM's IDP, in 2010/2011 approximately 49.8% of the municipal population were male and 50.1% of the population were female (StatsSA, 2008). This roughly equal proportion of gender is indicative of a population formed mostly through natural population growth.

The population breakdown of the municipality is shown in Table 7. As can be seen from this table, the roughly equal gender distribution is reflected in most population groups. The predominance of males in the Indian/ Asian category may be a statistical anomaly caused by the very small size of this group.

Table 7: Population group and gender distribution for the Matjhabeng LM

Population group	Male	Female	Total
African	49.8%	50.2%	89.7%
Coloured	49%	51%	1.3%
Indian or Asian	62%	38%	0.3%
White	50.2%	49.8%	8.6%
Total			**100%**

Source: StatsSA 2008

Figure 5 below shows the age and gender distribution of the population of the wards constituting the local study area. As can be seen from this figure, the roughly equal gender distribution characterising the local municipal area is also evident at ward level. The figure also indicates that the population of Ward 3 is slightly older than that of Ward 2, with a larger proportion of the population in the 35-64-year category.

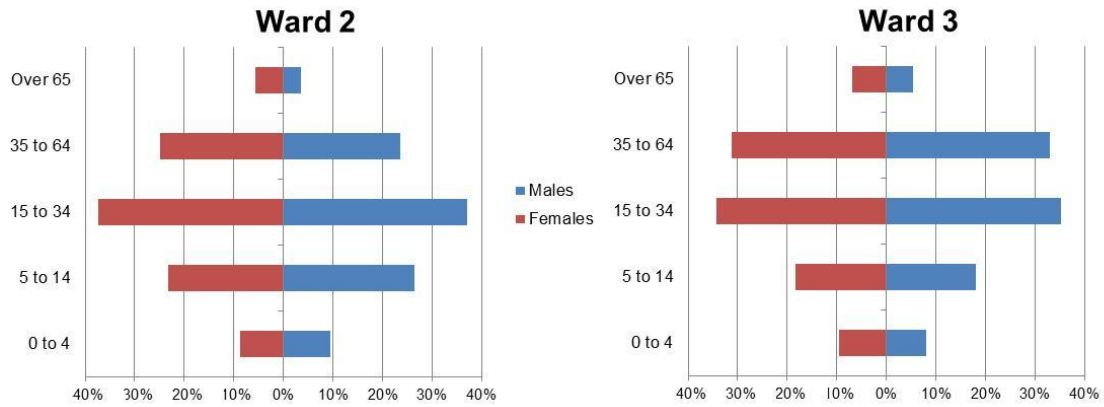


Figure 5: Age and gender per ward

Source: StatsSA 2001

5.1.2.3 Household size

Table 8 shows that there was a slight decrease in the average household size between 2001 and 2007 in the Matjhabeng LM. This trend mirrored the decline in average household size on both the district and provincial level. These may be caused by the retrenchment of mine workers in the region, forcing them to look for work within other provinces. As can also be seen from the table, household sizes in Wards 2 and 3 are slightly larger than the municipal average.

Table 8: Average household size per municipal area

Administrative area	Population		Households		Average household size	
	Census 2001	CS 2007	Census 2001	CS 2007	Census 2001	CS 2007
Free State Province	2 706 775	2 773 059	733 302	802 872	3.7	3.5
Lejweleputswa DM	657 012	639 651	184 469	202 391	3.6	3.1
Matjhabeng LM	408 170	405 031	120 289	131 622	3.4	3.1
Ward 2[4]	13 955		3 381		4.1	
Ward 3	14 307		3 894		3.7	

Source: StatsSA 2008

5.1.3 Language distribution

The main language spoken in the Free State province is Sesotho (64.4%), followed by Afrikaans (11.9%) and then isiXhosa (9.1%) (StatsSA, 2001). As can be seen from Figure 6 below, this language distribution is mirrored in Ward 3. In Ward 2 however, isiXhosa is the second most prominent and Afrikaans is very limited.

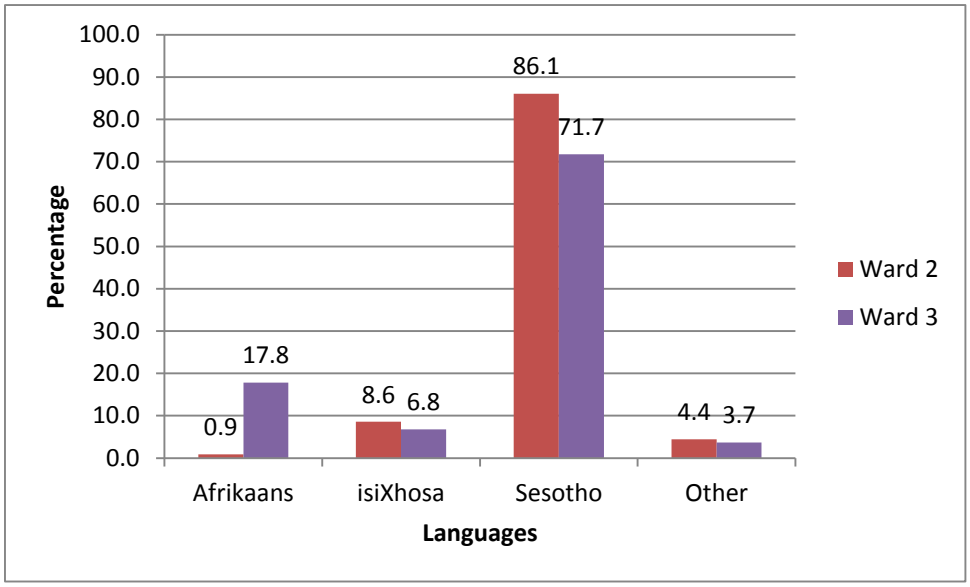


Figure 6: Main languages spoken in Wards 2 and 3

Source: StatsSA 2001

[4] The absence of ward-level data for 2007 is due to the fact that Community Survey data are only disaggregated to municipal level.

5.1.4 Labour force skills

The most dominant education level in both wards is secondary schooling. The second highest is some primary school education. Ward 3 has a higher occurrence of higher level education when compared to Ward 2, scoring more in the secondary schooling, Grade 12 and higher education categories (Table 9).

Table 9: Education levels of individuals over 20 years per ward

Education levels	Ward 2	Ward 3
No schooling	18.7%	10.6%
Some primary	26.4%	20.5%
Complete primary	8.9%	8.1%
Secondary	32.7%	38.2%
Grade 12	11%	17.9%
Higher	2.3%	4.6%
Total	**100%**	**100%**

Source: StatsSA 2001

The dominant occupation in both wards is that of the elementary occupation category. Elementary occupations comprise low-skilled jobs such as cleaners and helpers, labourers, food preparation assistants, street sales and service workers, refuse workers and other elementary work[5]. The second highest is that of plant/machine operators (Table 10).

Table 10: Occupations[6] per ward

Occupations	Ward 2	Ward 3
Elementary	41.%	37.2%
Plant/Machine operators	12.9%	14.4%
Craft/Trade	13.3%	11%
Undetermined	10.6%	6.9%
Agricultural/Fishery	2.3%	6.4%
Clerks	4.8%	6.4%
Technicians	5.2%	5.9%

[5] International Labour Organization. *Resolution Concerning Updating the International Standard Classification of Occupations*. Adopted at the Tripartite Meeting of Experts on Labour Statistics, 6 December 2007.

[6] Statistics South Africa defines all occupations according to the International Standard Classification of Occupations (ISCO) system of the International Labour Organisation (ILO).

Occupations	Ward 2	Ward 3
Service workers	6.5%	5.4%
Legislators/Senior officials	0.7%	3.3%
Professionals	2.3%	3.2%
Total	**100%**	**100%**

Source: StatsSA 2001

5.1.5 Health

5.1.5.1 Respiratory issues

TB management remains a challenge in South Africa; especially its co-morbidity with HIV/AIDS. South Africa has one of the highest incidence rates of TB in the world. In 2010, the incidence rate for all types of TB was 805 per 100,000. The Free State Province is one of the provinces that has reported the least improvement in TB cure rates, with only a four percentage point improvement in the last four years. However, the TB cure rate was 71.4% in 2009, which was close to the national average of 71.1%. The TB cure rate in Lejweleputswa District was 71.2% in 2009. The sputum smear conversion rate[7] in the district improved marginally in 2009 from 74.9% to 77.8% in 2010. Both are still below the World Health Organisation (WHO) recommended rates (>85%). There were 963.7 cases per 100 000 of TB in Lejweleputswa District Municipality in 2011, which was the highest in the province. In 2011, the new HIV positive patients who had a confirmed TB rate was 8% (Day et al., 2009).

5.1.5.2 Sexually transmitted infection (including HIV/AIDS)

South Africa is experiencing a severe generalised HIV epidemic which is affecting the social and economic fabric of the country. The causes are multifactorial, but poverty, lack of education and vulnerability in certain sectors are important contributing factors. According to the National HIV and Syphilis Prevalence Survey 2009, it is estimated that the prevalence of HIV in South Africa (in all age groups) is 10.6%, which is about 5.2 million people of the total population. Free State Province had the third highest HIV prevalence in the country at 12.6% (Shishana et al., 2009). The antenatal HIV prevalence for Lejweleputswa District Municipality was 33.4% (Day et al., 2009). In 2008, Matjhabeng Local Municipality was estimated to have the second highest HIV infection rate in the country. Infection rates of as high as 50% had been detected in some parts of the region (Shishana et al., 2009).

[7] This is the percentage of new smear-positive TB cases registered in a specific period that convert to smear-negative at the end of the initial phase of treatment.

5.1.5.3 Food- and nutrition- related issues

In 2010/2011, the incidence of diarrhoea in children under the age of 5 in Lejweleputswa District Municipality was 62 per 100 000 (Day et al., 2006). Recent data on the prevalence of stunting (low height-for-age indicating chronic malnutrition), underweight (low weight-for-age-indicating food availability and use concerns) and wasting (low weight-for-height indicating acute malnutrition) for children under the age of 5 in the Lejweleputswa District Municipality was not immediately available. However, the incidence of severe malnutrition in children under 5 years was estimated to be 3.9 per 1000 in 2010 (Day et al., 2006).

5.1.5.4 Non-communicable diseases (NCDs)

Non-communicable diseases (NCD) play an important role in the overall burden of disease in the Free State Province. Strokes, chronic lung disease, heart disease, hypertension and diabetes are all mentioned in the top 20 disease burdens in the province. There is very little information in the public domain related to NCD at the district level. The diabetes mellitus and hypertension detection rate in 2010 was estimated to be 0.1% (Day et al., 2006).

5.1.5.5 Health services infrastructure and capacity

Of the population of Lejweleputswa, 14.6% had access to a medical scheme in 2007. The district is socio-economically above average, but the amount spent per capita on non-hospital primary health care in 2009/10 at R378, is the fourth-lowest in South Africa, and inadequate to provide a comprehensive, good quality of primary health care (Day et al., 2006).

The number of health facilities and beds in Lejweleputswa District Municipality is shown in Table 11 below (Day et al., 2009). A large majority (86.6%) of children under the age of one had been immunised. Moreover, just under three-quarters (72.3%) of women in the district delivered their last child in a health facility. In urban areas the number of clinics and hospitals are inadequate and mostly overcrowded. Emergency medical services are not readily available during emergencies and the response time is slow. The availability of medicine in clinics is problematic due to inadequate control and poor distribution.

Table 11: Health facility infrastructure in Lejweleputswa DM

Health Facility/Infrastructure	Number
Beds (private sector)	1 017
Beds (public sector)	735
Clinics	49
Mobile Health Services	20
District Hospitals	5
Private Hospitals	3
Regional Hospital	1

Health Facility/Infrastructure	Number
Community Health Centres	1
Specialised Hospitals	0
Provincial Tertiary Hospital	0

5.1.6 Infrastructure and services

The Matjhabeng LM IDP (2012) stresses the need to take into account the large number of mine workers that have been retrenched due to the restructuring of the mining sector when predicting future service delivery demands.

5.1.6.1 Water

Water infrastructure consists mostly of reservoirs and pipelines of Sedibeng Water. The Goldfields region and the mines are supplied with water from the Vaal River near Bothaville and from the Sand River. The main water reservoirs are east of Allanridge, in Welkom, north and south of Virginia. Pump stations are present in the east of Allanridge and at Virginia where a purification plant also exists. Other water infrastructure was constructed by the then-Department of Water Affairs and Forestry (now re-named the Department of Water Affairs) and includes dams in Allemanskraal and canals serving the Sand – Vet irrigation scheme (Matjhabeng LM IDP 2011/2012).

Table 12 shows that the Matjhabeng LM has done much to reduce the level of no access to water and to expand household access to water at both the RDP standard and inside dwellings and yards.

Table 12: Access to piped water in Matjhabeng LM

Type of piped water source	Census 2001	Community Survey 2007
Piped water inside the dwelling	24.9%	60.2%
Piped water inside the yard	44.8%	30.7%
Piped (tap) water to community stand: distance < 200m from dwelling	10.6%	
Piped (tap) water to community stand: distance > 200m from dwelling	14.8%	
Piped water from access point outside the yard		7%
Total piped water	**95.1%**	**97.9%**

Source: StatsSA

Table 13 compares Wards 2 and 3 in terms of access to piped water. The large majority of households in Ward 2 had access to piped water inside their yards, with only 10.1% having had piped water inside their dwellings. Ward 3 represents a slightly better scenario with just over half having had access to piped water inside their yards and 29% having had piped water inside their homes.

Table 13: Access to piped water per ward

Type of piped water source	Ward 2	Ward 3
Dwelling	10.1%	29%
Inside yard	83.8%	54.3%
Community stand	0.6%	7.3%
Community stand over 200m	0.4%	5%
Total piped water	**94.9%**	**95.6%**

Source: StatsSA 2001

5.1.6.2 Toilet facilities

The Matjhabeng LM has seen an increase in flush toilets connected to the sewerage system from 2001 (60.1%) to 2007 (78.4%). There has also been an increase in flush toilets connected to a septic tank and a decrease in all other toilet categories. The most notable change has been the decrease in the proportion of households who relied on chemical toilets. In 2007, no chemical toilets were recorded (Table 14).

Table 14: Access to toilet facilities in the Matjhabeng LM

Toilet facilities	Census 2001	Community Survey 2007
Flush toilet (connected to sewerage system)	60.1%	78.4%
Flush toilet (with septic tank)	0.8%	1.3%
Bucket latrine	17.3%	11.1%
Pit latrine without ventilation	10.9%	6.9%
None	9.7%	2.1%
Pit latrine with ventilation (VIP)	0.9%	0.2%
Chemical toilet	0.5%	0%
Total	**100%**	**100%**

Source: Matjhabeng LM IDP 2011/2012

Table 15: Access to toilet facilities within the district municipality

Administrative area	Pit latrine		Bucket toilet		No toilet	
	Census 2001	CS 2007	Census 2001	CS 2007	Census 2001	CS 2007
Lejweleputswa DM	12.5%	7.7%	29.9%	20%	10.1%	2.8%
Masilonyana LM	9.2%	2.5%	55.8%	30.2%	11.6%	1.9%
Tokologo LM	13.2%	28.2%	46.5%	34.0%	22.%	16.8%
Tswelopele LM	19.1%	10.9%	52.7%	22.5%	12.2%	2.4%
Matjhabeng LM	11.7%	7.0%	17.2%	11.1%	9.7%	2.1%
Nala LM	14.9%	9.8%	54.7%	52.6%	5.6%	3.1%

Source: StatsSA 2008

As shown in Table 16, Ward 2 has more households that make use of the bucket latrine system (80.4%) when compared to Ward 3 (21%). Ward 3 has a higher proportion of households that have access to flush toilets (47.5%) than that of Ward 2 (17.5%). The Matjhabeng LM has put a project in place to eradicate the bucket system toilets. The project estimated cost was over R133 million (Matjhabeng LM IDP 2011/2012).

Table 16: Access to toilet facilities per ward

Toilet facilities	Ward 2	Ward 3
Flush toilet	17.5%	47.5%
Bucket latrine	80.4%	21%
Pit latrine	0.5%	12.1%
None	1%	11.8%
VIP	0.2%	4.8%
Flush septic tank	0.3%	2.6%
Chemical toilet	0%	0.2%
Total	**100%**	**100%**

Source: StatsSA 2001

5.1.6.3 Refuse removal

There has been an increase in the number of residents in the Matjhabeng LM that have access to a refuse removal service. The number of residents with no basic refuse disposal has reduced by 3.9% and the number of people with access to communal refuse is slowly reducing (Table 17). The number of households that have weekly refuse removal has

increased significantly. The Matjhabeng LM has out-performed all other local municipalities in its district, including the district itself (see Table 18).

Table 17: Refuse removal service within the Matjhabeng LM

Refuse service	Census 2001	Community Survey 2007
Removed by local authority/private company at least once a week	77.2%	89.1%
Own refuse dump	12.1%	7.8%
No rubbish disposal	5.6%	1.7%
Communal refuse dump	3.8%	1.3%
Removed by local authority/private company less often	1.3%	0.1%
Total	**100%**	**100%**

Source: Matjhabeng LM IDP 2011/2012

Table 18: Refuse removal services in Lejweleputswa DM and its local municipalities

Administrative area	Removed by local authority/ private company		No refuse disposal	
	Census 2001	CS 2007	Census 2001	CS 2007
Lejweleputswa DM	72%	82.8%	6.8%	2.5%
Masilonyana LM	62.8%	60.5%	10.2%	1.7%
Tokologo LM	49.9%	49.3%	6.8%	22.1%
Tswelopele LM	32.6%	80.3%	9.8%	1.4%
Matjhabeng LM	78.5%	89.2%	5.6%	1.7%
Nala LM	74.7%	84.6%	8.9%	2%

Source: StatsSA 2008

Ward 2 has a higher occurrence of weekly municipal refuse removal than that of Ward 3. Ward 3 has a higher number of households that make use of private waste dumps (Table 19).

Table 19: Access to refuse removal service per ward

Refuse service	Ward 2	Ward 3
Municipal weekly	99%	72.3%
Municipal other	0.3%	0.6%

Refuse service	Ward 2	Ward 3
Communal dump	0%	0.8%
Own dump	0.1%	17.4%
No disposal	0.6%	8.9%
Total	**100%**	**100%**

Source: StatsSA 2001

5.1.6.4 Electricity for lighting, cooking and heating

There is a well-established electrical network within the Matjhabeng LM. Eskom is the service provider for the mines and townships in the municipal area, thus sufficient bulk infrastructure is available to serve the whole area. The main challenge within the municipality is the aging electrical infrastructure in some towns. It has become very expensive to electrify the rural areas as well as farms and farming communities. Government's plan is to electrify all areas by the end of 2014.

Table 20 and Table 21 below show that the Matjhabeng LM is highly dependent on electricity as a source of energy for lighting, cooking and heating. This shows the lack of or a decrease in alternative sources of energy to help relieve the pressure on the electricity grid.

Table 20: Access to power sources within the Matjhabeng LM

Power source	Census 2001	Community Survey 2007
Electricity	54.3%	77.1%
Gas	2.1%	1.6%
Paraffin	39.8%	20.5%
Coal	0.8%	0.2%
Wood	2.1%	0.6%
Solar	0.3%	0%
Animal dung	0.7%	0.1%
Total	**100%**	**100%**

Source: Matjhabeng LM IDP 2011/2012

Both wards have relatively equal access to electricity, with ward 2 being more dependent on candles for lighting purposes.

Table 21: Access to power sources per ward

Power source	Ward 2	Ward 3
Electricity	76.1%	81.8%
Gas	0.1%	0.2%
Paraffin	3%	4.1%
Candles	20.5%	12.7%
Solar	0.1%	0.9%
Other	0.3%	0.3%
Total	**100%**	**100%**

Source: StatsSA 2001

5.1.6.5 Roads and transport

The municipality has well established road and transportation infrastructure. The main challenge has been the cost of maintaining such infrastructure as it ages over time. This has major implications for the budget of the municipality. The main public transport system operating in Matjhabeng is privately owned taxis. The rail network that passes through Hennenman and Virginia is a mainline service linking the Municipality with Gauteng, KwaZulu Natal, Eastern Cape and the Western Cape. However there is no local rail network or bus service operating in Matjhabeng Municipality

5.1.6.6 Education facilities

Tertiary education facilities are available in Welkom and include the following:

- Welkom Technical College;
- Welkom Technological Institute;
- FET College Goldfields - geared towards employment opportunities; and
- Central University of Technology, Free State (CUT) satellite campus (CUT's core competencies are in science, engineering and technology).

5.1.7 Housing

The Matjhabeng LM has seen a steady increase in the number of households moving towards formal housing (4.4% increase) and a decrease in informal housing (13.1% decrease) between the years of 2001 and 2007 (Table 22).

Table 22: Housing within the Matjhabeng LM

Administrative area	Formal Housing		Informal Housing	
	Census 2001	CS 2007	Census 2001	CS 2007
Free State Province	66.5%	71%	26.1%	18.4%
Lejweleputswa DM	56.8%	67.8%	40.6%	22.6%
Matjhabeng LM	60.1%	64.5%	36.8%	23.7%

Source: StatsSA 2008

As shown in Table 23, Ward 3 has a larger number of households that have formal housing (84.3%) compared to ward 2 (43.8%). Ward 3 also has a larger number of traditional households (5%) than Ward 2 (0.6%).

Table 23: Type of dwelling per ward

Type of dwelling	Ward 2	Ward 3
Formal	43.8%	84.3%
Informal	55.3%	10.6%
Traditional	0.6%	5%
Other	0.3%	0.2%
Total	**100%**	**100%**

Source: StatsSA 2001

5.1.8 Crime

Table 24 below is a representation of crime within the Free State province. Categories of crime that have recorded an increase in occurrence include housebreaking and violence against women and children. Contributing factors to this rise in specific crimes include:

- High unemployment rate and migration from rural to urban areas.
- Lack of resources within the police service (transport, manpower).
- Ineffective functioning of neighbourhood watch organization and community police forums.
- Lack of visible policing.
- Lack of accessibility to police stations

Table 24: Crime categories

Types of crimes	Incidence
All theft not specified	19.8%
Common assault	15.5%
Assault with intent to inflict grievous bodily harm	11.2%
Burglary at residential premises	11.1%
Malicious damage to property	5.5%
Crimen injuria	4.7%
Theft from vehicles	4.5%
Common robbery	3%
Stock theft	2.9%
Robbery with aggravating circumstances	2.8%
Attempted murder	2.8%
Rape	2.5%
Burglary at business premises	2.5%
Drug-related crimes	2.5%
Shoplifting	2%
Theft of motor vehicle or motor cycle	2%
Commercial crime	1.5%
Driving under the influence of alcohol or drugs	0.7%
Murder	0.5%
All Other (at least 10 other crimes such as highjacking, house robbery, illegal arms, etc.)	0.3% each

Source: Matjhabeng LM IDP 2011/2012

5.1.9 Employment

Table 25 shows an upward trend amongst the employed in the municipality in that there was an increase in employment of 9.5% between 2001 and 2007. Employment in Ward 3 is higher than in the local municipality and Ward 2. Ward 2 has the largest proportion of Not economically active individuals (Table 26).

Table 25: Employment within the Matjhabeng LM

Economic Status	Census 2001	Community Survey 2007
Employed	34.3%	43.8%
Unemployed	29.8%	23.7%
Not economically active	35.9%	32.5%
Total	**100%**	**100%**

Source: Matjhabeng LM IDP 2011/2012

Table 26: Employment distribution per ward

Persons	Ward 2	Ward 3
Employed	19.1%	36.4%
Unemployed	33.5%	21.8%
Not economically active	47.4%	41.8%
Total	**100%**	**100%**

Source: StatsSA 2001

Between 2001 and 2007, there were increases in the number of individuals employed in the majority of industries, namely Wholesale and trade, Manufacturing, Finance and Construction, while Mining (currently the largest industry in the municipality), Agriculture and Transport were in decline. If the growing industries can continue to grow in the shadow of declining mining and agricultural industries, it will demonstrate a resilient and transformed economy that can be sustained without the presence of primary industries such as mining and agriculture (Table 27). However, the decline of these industries will and are having a negative impact on employment, and the decline of agriculture will likely affect food security and food prices.

Table 27: Industries within the Matjhabeng LM

Industry type	2001	2007
Mining and Quarrying	39.6%	31%
Community, social and personal service	18.6%	18.5%
Wholesale and trade, repairs, hotels and restaurants	15.3%	18.3%
Manufacturing	5.4%	9.8%
Financial intermediation, insurance, real estate and business service	6.2%	7.5%

Industry type	2001	2007
Construction	3.6%	5.4%
Agriculture , Hunting , forestry and fishing	6.5%	5.1%
Transport storage and communication	4.2%	3.7%
Electricity , gas and water supply	0.6%	0.6%
Total	**100%**	**100%**

Source: Matjhabeng LM IDP 2011/2012

5.1.10 Income Levels

As shown in Table 28, The Matjhabeng LM displayed a positive shift in the number of individuals from low income levels to middle income levels. The No income category dropped by just over 10% from 2001 and 2007. This can be viewed as an indication of socio-economic development within the municipal area.

Table 28: Individual monthly income in the Matjhabeng LM

Income categories	2001	2007
No income	59.9%	48.7%
R 1-R 400	7.7%	6.4%
R 401-R 800	8.5%	8.3%
R 801-R 1 600	9.6%	13%
R 1601-R 3 200	7.4%	10.1%
R 3 201-R 6 400	4.1%	7.4%
R 6 401-R 12 800	2.0%	4.1%
R 12 801-R 25 600	0.5%	1.6%
R 25 601-R 51 200	0.1%	0.3%
R 51 201- R 102 400	0.1%	0.1%
R 102 401-R 204 800	0%	0%
R 204 801 or more	0%	0%
Total	**100%**	**100%**

Source: StatsSA

The majority of individuals in both wards reported having no monthly income. Ward 2 has the largest number of individuals who do not earn an income, while Ward 3 recorded a higher percentage of income earners within most income categories than Ward 2 (Table 29).

Table 29: Individual monthly income in Wards 2 and 3

Income categories	Ward 2	Ward 3
None	82.6%	67.3%
R 1 – R 400	4.9%	9.7%
R 401 – R 800	7.5%	8.3%
R 801 – R 1600	2.6%	4.5%
R 1 601 – R 3 200	1.8%	5.6%
R 3 201 – R 6400	0.4%	2.8%
R 6 401 – R 12 800	0.2%	1.2%
R 12 801 – R 25 600	0%	0.3%
R 25 601 – R 51 200	0%	0.1%
R 51 201 – R 102 400	0%	0.1%
R 102 401 – R 204 800	0%	0%
Over R 204 801	0%	0%
Total	**100%**	**100%**

Source: StatsSA 2001

5.1.11 Spatial distribution of economic activities

The economy of Matjhabeng can be divided into three main categories i.e. primary, secondary and tertiary sectors. Research shows that the economies of Welkom (53%), Odendalsrus (38%) and Virginia (78%) are controlled by the mining operations within that area, whilst Hennenman is dominated by manufacturing (41%), agriculture (17%), trade (10%) and financial operations (10%).

When looking at the contribution of each municipality to the district economy (see Table 30 below, Matjhabeng LM outperforms the other municipalities in all sectors, except Agriculture. Manufacturing, Finance and Trade in the Matjhabeng LM are the largest contributors to the district economy.

Table 30: Contribution of each municipality in the Lejweleputswa District per sector, 2004

Local Municipality	Agriculture	Mining	Manufacturing	Electricity	Construction	Trade	Transport	Finance	Community Services
Tokologo	6.3%	0.2%	1.4%	1.5%	1.9%	0.9%	1%	1.2%	2.1%
Tswelopele	39.9%	0%	3.7%	4.6%	1.4%	3.7%	3.7%	4.2%	5.2%
Nala	25.7%	1.3%	6.6%	8.1%	11.8%	8.8%	11.4%	5.2%	9.3%
Matjhabeng	17.6%	79.6%	84.8%	77.1%	75.9%	81.7%	79.2%	84.7%	76.1%
Masilonyana	10.5%	18.9%	3.5%	8.7%	9%	4.8%	4.7%	4.7%	7.3%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%

Source: Matjhabeng LM IDP 2011/2012

According to the Matjhabeng LM IDP, about 72% of the Lejweleputswa district's economic output is generated within the Matjhabeng LM. The relative contributions from Matjhabeng LM and Masilonyana have decreased since 1996 as the two municipal areas have seen an overall decline in the mining industry and operations within their respective areas. In contrast, the remaining three municipalities' contributions to the district increased between 1996 and 2004 due to a decline in the mining operations in the other local municipalities.

5.1.11.1 Mining

There are a number of mines within the Matjhabeng LM. These include

- Matjhabeng Gold Mine
- Erfdeel Mine
- Free State Geduld Gold Mine
- Jurgenshof Unisel Gold Mine
- Loraine Mine
- President Brand Gold Mine
- Saaiplaas Mine
- Virginia Mine
- Goldfields Beatrix Mine
- Western Holdings Gold Mine

Mining dominates the local economy, contributing 58% of GDP to the area and 19% to the province. Strategies are being developed by the FGF Development Centre, an economic development arm of the Matjhabeng Council, to reduce the dependence of the municipalities on the mining industry.

5.2 Site-specific study area

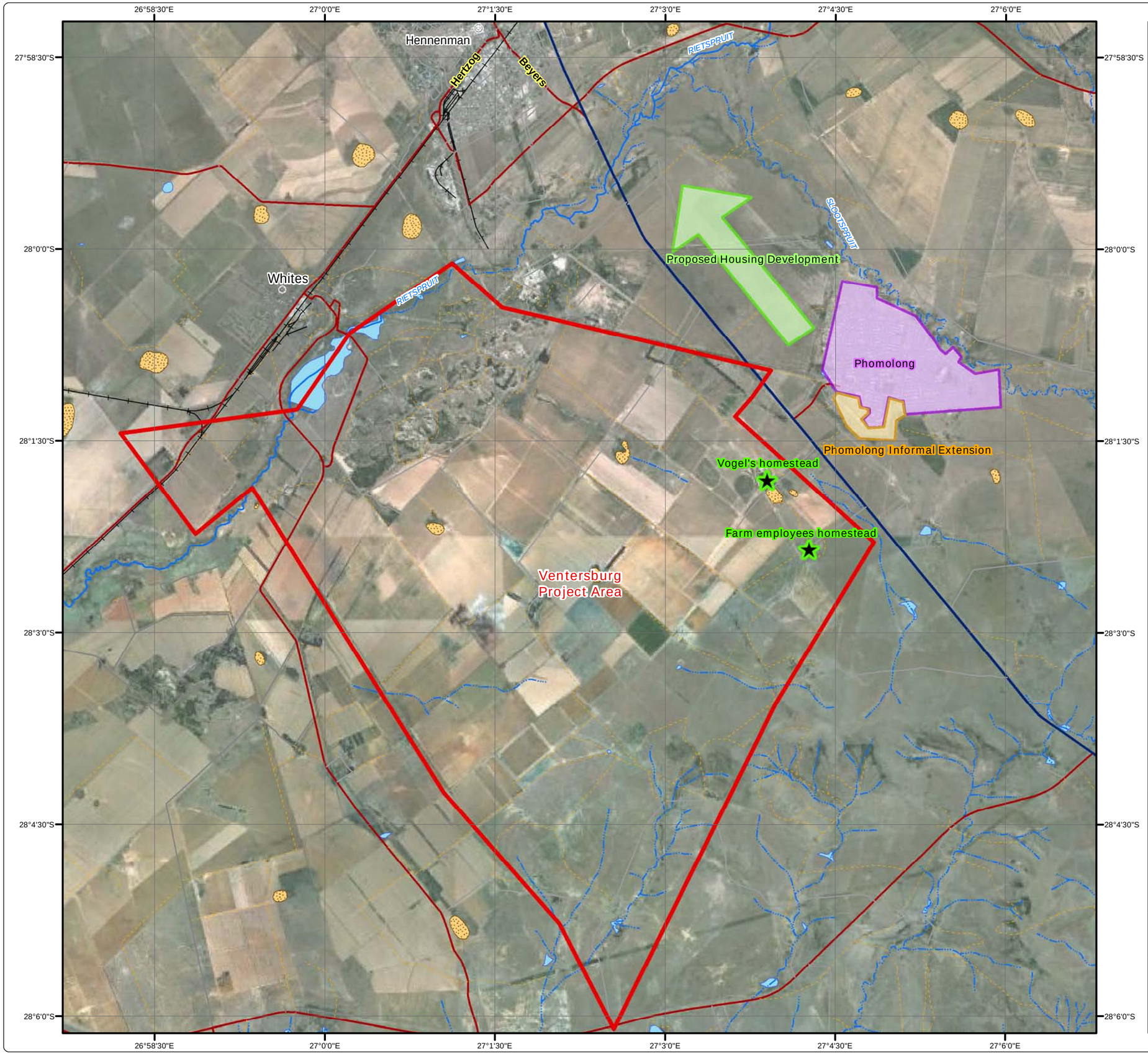
The figure below depicts the location of the proposed project site relative to Phomolong Township. The site-specific project area can be subdivided into the following areas:

- Vogel's commercial farm (see Section 5.2.1);
- Phomolong township (see Section 5.2.2); and
- Hennenman and White's communities (see Section 5.2.3).

Figure 7

Ventersburg Gold ESIA

Project Footprint & Land Usage



Legend

- Project Area
- Arterial / National Route
- Main Road
- Minor Road
- Tracks
- Perennial Stream
- Non-Perennial Stream
- Dam / Lake
- Non-Perennial Pan
- Perennial Pan

Project Footprint

- Phomolong
- Phomolong Informal Extension
- Proposed Housing Development
- Homesteads

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Projection: Transverse Mercator	Ref #: tdm.GOL1675.201211.115
Datum: Hartebeeshoek 1984	Revision Number: 1
Central Meridian: 27°E	Date: 19/11/2012

N

0 1.25 2.5

Kilometres

1:55 000

5.2.1 Vogel's commercial farm

The proposed project is situated on a commercial agricultural and livestock farm (Vogelsrand). The farm is owned by the Vogel family, which is the fifth generation to farm on this land. The farm is primarily used to cultivate maize and breed cattle for commercial purposes.

Figure 8: Primary farm residence

Mr. Vogel relies on specific sections of his land for the cultivation of maize, as these areas are more fertile than others. The chaff and other crop remains left on the fields after harvesting provide valuable feed for his cattle. If this source of food is to be lost as a result of mining activities, he would have to purchase substitute feed and this will not be cost-effective. In other words losing access to parts of the croplands might make the entire farming operation non-profitable. Mr Vogel therefore emphasized that if mining is to go ahead on the property, he will not be willing to sell only part of the property.

Figure 9: Maize and cattle production

Farming activities provide employment for 20 to 30 individuals, although this number varies, depending on the season. Each of these employees has several dependents, which

substantially increases the number of people dependent on the incomes earned by his farmworkers.

Several families of farmworkers reside in dwellings on Mr. Vogel's property, while others reside in the neighbouring township. The inhabitants of these dwellings do not own the property, but have a longstanding housing arrangement with Mr Vogel. There are eight farmworker dwellings, most of which have access to electricity, pit latrines, and water pumped from a borehole.

Figure 10: Residence for farm employees

5.2.2 Phomolong

The majority of the population that might be affected by the proposed development resides in Phomolong, which is a formal township located across from the R70 road, 500m east of the project site; it is situated within municipal wards 2 and 3, which were described earlier (see Section 5.1). The Phomolong community originally resided on a farm called Venter's Vlugt which is situated close to Hennenman. In 1948 they were forced to move to their current location, where it has grown to an estimated 5 000 dwellings.

This section provides a brief description of the socio-economic characteristics of the Phomolong community.

5.2.2.1 Demographics

Although the largest segment of the town is formalized, recent population growth, combined with a housing shortage, has resulted in the informal expansion of the township towards its south-western outskirts. This expansion is headed directly towards the north eastern edge of the proposed project footprint. It is estimated that the informal section of Phomolong provides shelter to just over 1 000 people.

The informal extension does not align with local spatial planning, which aims to integrate Hennenman and Phomolong by directing housing and business development on the north-eastern side of the R70 to eventually connect the two towns. It should be noted that this development is hampered by several physical restrictions that include a river, sewerage

works and a dumping site. Current development plans indicate that 2 000 housing units will be built for this stretch of land.

5.2.2.2 Culture, language and migration

The community is mostly Sesotho-speaking and as such follows the cultural traditions associated with this group. The community is not under the jurisdiction of a Traditional Authority. Phomolong has experienced little in-migration into the area in recent years, however, some inhabitants originate from foreign countries. Community members affirmed that foreign families are mostly from Lesotho, Ethiopia, Bangladesh, Pakistan, China and Malawi. These groups reportedly engage mostly in small businesses. There has in the past been protest action against foreign residents. Currently there is no marked tension between the local inhabitants and foreigners.

5.2.2.3 Economic Overview

There is very little economic development or diversification within Phomolong, and economic activity in the township is limited to mining, agriculture and micro and small enterprises involved in general trading. The minority that is employed work mostly in the agricultural and mining sectors. Major employers in these sectors include Tiger Mills, Oranje Mynbou en Vervoer, and Serfontein and Seuns. Other business opportunities in the community are limited to micro and small enterprises such as spaza shops, taverns, tuck shops and general dealers. Most of these businesses are well established, have been trading for more than five years, and depend on multiple trading activities to survive. A considerable proportion of these enterprises have in recent years been bought out by foreigners.

Figure 11: Agricultural based livelihoods

A decline in economic activity is primarily attributed to several mine closures in the surrounding area. Employment opportunities within in the core economic sectors are extremely scarce.

Among the town's residents, unemployment is high, and many households have little or no income. Consequently, large proportions of households survive on government grants and suffer from poverty.

5.2.2.4 Service Delivery

In general, the type and integrity of Phomolong's physical infrastructure is sound enough for the town to be integrated into the wider economy. However, without considerable repair and on-going maintenance, the long term sustainability of a significant part of the township's service infrastructure is at risk. The Municipality's financial situation is precarious, largely due to the inability of its poverty-stricken rates base to pay for services.

5.2.2.4.1 Access to water, sanitation and electricity

The majority of households in the formal township have access to piped water and flush toilets. However, access to sanitation is a problem, as a considerable number of households still rely on the bucket system (e.g. Phomolong Extension 1). Service delivery is a major problem in the informal part of the Township. Currently these residents rely on a small number of community standpipes for water. They use pit latrines or revert to open defecation practices, which has several community health risks.

Most households in the formalized part of the township have access to electricity, which they use for lighting, heating and cooking. However the decreasing affordability of this energy source is reducing the community's reliance on electricity and increasing their dependence on sources such as paraffin, wood and coal. The informal extension area has no electricity and relies on floodlights for lighting, while carbon fuel sources are used for heating and cooking.

Figure 12: Resident collecting water from communal water point

5.2.2.4.2 Development and housing

Phomolong is experiencing a significant lack of affordable and available housing, as is evidenced by the large informal extension on its south-western edge. The housing problem

is exacerbated by the poor quality of existing houses, which are reportedly starting to deteriorate and collapse. Housing problems increase environmental health risks to which the community is exposed. A severe shortage of housing, which leads to overcrowding, may contribute to the spread of diseases such as Tuberculosis, especially among populations made vulnerable by HIV/AIDS. Government's ability to address the problem is hampered by the large number of applicants for RDP houses throughout the rest of the Municipality.

Figure 13: Informal extension of Phomolong

5.2.2.4.3 Education

Access to basic education in Phomolong is relatively good. There are approximately 20 crèches that cater for the vast number of young children. The community also has access to four primary schools and two secondary schools. Most teachers are formally trained through colleges situated in Welkom and permanently employed by government. With regards to enrolment rates, girls tend to outnumber boys in both primary and secondary schools. Although a large proportion of Phomolong's high school graduates continue their studies at higher education institutions, most of them seek employment elsewhere as there is a lack of opportunities in the area.

As is the case in many rural schools, education infrastructure and facilities are limited. Most schools experience a shortage of space for learners, and several schools have a shortage of sporting facilities and equipment. Apart from infrastructure, schools are also plagued with high HIV/ AIDS rates, teen pregnancies and alcohol abuse amongst their learners.

Figure 14: Kheteleng secondary school

5.2.2.4.4 Health

Phomolong has access to one clinic, which provides general consultation services to the township and neighboring communities. The clinic employs five professional nurses; however, they are not enough to service the entire community. The clinic is exceeding its maximum service delivery capacity on a monthly basis as it attends to an average of 6 000 patients per month. Apart from a shortage of staff and diagnostic equipment, the clinic does not have any vehicles to provide mobile service to the community.

Community health is a serious concern in Phomolong, with HIV/ AIDS and TB being the most devastating diseases. Other major diseases include high blood pressure and diabetes. A large number of vulnerable child-headed households are found in Phomolong, as a result of their parents dying from HIV/AIDS.

Recent estimates from Phomolong clinic shows that 30% of males who test for HIV show up as positive, while 60% of females test positive. The rate for females is higher due to the fact that more females are tested during pregnancy. The prevalence rate among secondary school learners is alarming with several estimates putting it at almost 10%.

The high HIV/ AIDS prevalence is partially ascribed to previous mining activities, which is associated with sexual promiscuity and prostitution. A doctor visits the clinic on a weekly basis to attend to patients with HIV/ AIDS. The clinic also provides free Anti-retro viral treatment to those affected in Hennenman, Phomolong, Ventersburg and Mamahabane.

Figure 15: Phomolong clinic

5.2.2.4.5 Crime

Phomolong community is serviced by Hennenman police station, which has a satellite station in the township. The station is short of staff and under equipped, especially if one takes into consideration the population residing in their service area. Despite this, the station is working closely with community policing forums that assist the police, especially during weekends when crimes related to substance abuse are high.

Alcohol abuse and related crimes such as assault, domestic violence and petty theft is a major concern in the area. Most of these incidents take place from Thursday to Sunday when people are inclined to consume alcohol in local taverns. Apart from alcohol related incidents, livestock theft is also a common occurrence.

5.2.2.4.6 Road infrastructure and transportation

Phomolong has access to a poor internal transport system, with no centralized taxi rank. The primary access road to the township is the R70 road which connects Hennenman and Ventersburg. This road is scattered with potholes and will deteriorate rapidly if not maintained. Most roads within the township are un-surfaced gravel roads, and the few tar roads within township are severely deteriorated. Community members expressed the need for surfacing gravel roads and building speed bumps to slow down vehicles that speed.

5.2.3 Hennenman and Whites

Hennenman is situated just less than 7km north of the proposed project. The town came into being as a railway siding known as Ventersburg Road, serving the town of Ventersburg. The settlement developed around the station and was originally known as Havengaville. The town's population is estimated at around 25 000. Situated close to Hennenman is a small formal settlement called Whites, which also originated as a result of railway activities.

5.3 Summary of baseline conditions

The major socio-economic trends in the study area are reflected in the following statements:

- In terms of the regional and local study areas:
  - The key economic sectors in the area are mining, manufacturing and agriculture. These three sectors are also major employers in the surrounding towns. Despite recent mine closures, mining is still a substantial employer in the district, and its service and goods requirements, together with the consumer needs of employees, stimulate secondary industries and further job creation;
  - The relative affluence of urban areas such as Welkom, Virginia and Ventersburg masks the poverty and underdevelopment of rural areas in the study area. Access to social services and resources is also skewed in favour of urban areas;
  - Unemployment, high incidences of HIV/AIDS and TB, and a lack of housing are also major problems affecting the district as well as the site-specific study area; and
  - Access to household services is generally good and reflects that of the district, with most households having access to safe drinking water, 85% having access to toilet facilities and roughly three quarters having electricity for lighting. However this picture is skewed towards formal areas.
- In terms of the site-specific study area:
  - It comprises Phomolong Township, Vogel's commercial farm, and the Hennenman and Whites communities;
  - Phomolong is a formal township located across from the R70 road, 500m east of the project site. It comprises about 5 000 dwellings, including about 1 000 in an expanding informal section;
  - The farm owned by the Vogel family is primarily used to cultivate maize and breed cattle for commercial purposes. Several families of farmworkers reside on Mr. Vogel's property;
  - Hennenman is situated just less than 7km north of the proposed project. The town came into being as a railway siding known as Ventersburg Road, serving the town of Ventersburg. The settlement developed around the station and was originally known as Havengaville. The town's population is estimated at around 25 000; and
  - Whites is a small formal settlement situated close to Hennenman.

6 SOCIO-ECONOMIC IMPACTS AND RISKS

The objective of this section is to identify aspects of the receiving socio-economic environment that could be vulnerable to impacts associated with the proposed development, or could have significant implications for the planning or implementation of the development. These may constitute impacts that would require appropriate management and mitigation, or risks and constraints that would have to be accommodated in project design.

6.1 Potential socio-economic impacts

Anticipated socio-economic impacts of the proposed project are discussed below. The likelihood of cumulative impacts is also discussed.

6.1.1 Positive impacts

Although positive impacts do not have obvious risk implications for development projects, neglecting the opportunity to enhance these impacts can shape the context in which possible future negative impacts are perceived. By proactively embracing positive impacts it is possible to grow support from local populations and decrease risks related to community resistance. It is envisaged that the proposed development might have several positive impacts; these are discussed in turn below:

6.1.1.1 Impact on the local economy

The proposed project might result in several economic benefits for local communities through direct and multiplier effects that result from capital expenditure and construction activities. It is expected that construction activities will stimulate the local manufacturing and service sectors. This provides new business opportunities for micro and small businesses in communities such as Phomolong, provided they are formalized and able to meet the procurement requirements of the mine.

Local employment will also increase disposable income, which can stimulate other economic activities in areas such as Phomolong and Hennenman were small businesses are struggling. The proposed project might contribute to diversifying the economy in the immediate study area, which is currently heavily dependent on agriculture and livestock farming.

6.1.1.2 Employment opportunities

Unemployment in the local municipality is high (24%), resulting in a large proportion of the population having little to no income. This figure is likely to be much higher in rural areas such Phomolong. As mentioned in Section 3.1.4 above, it is anticipated that the project will create 300-400 employment opportunities during its construction phase as well as 1700-2000 employment opportunities during its operational phase. During both phases almost all unskilled tasks may be taken up by members of the local population. Any employment opportunities created by the proposed operation will therefore have significant positive

implications for local communities. Whether the unemployed and under-employed (defined as persons with intermittent or irregular employment) will be able to take up employment opportunities at the mine depends largely on their level of skills and work experience as only one third has secondary education.

With mining and quarrying being a major industry in the region, it is expected that at least some of the unemployed will have relevant skills to qualify them for employment at the mine. Those that are less skilled may be more suited to manual labour such as earthworks and road construction. Data collected in the study area revealed that several people have skills to execute elementary occupations and operate industrial machines. During the construction process potential candidates can also be identified to receive skills training for future opportunities.

The proposed operation will consider employing miners who were retrenched after recent mine closures in nearby areas such as Welkom.

6.1.1.3 Local socio-economic development

The proposed project has the potential to contribute to local socio-economic development, both through job creation and social investment, with particular reference to vulnerable communities and households (e.g. child-headed households) residing in the vicinity of the project. Socio-economic development initiatives can also be aligned to development initiatives listed in Matjhabeng LMs IDP as part of the mine's corporate social investment program. The following opportunities are listed in the IDP:

- Construction and/or upgrading of municipal sport and recreation facilities;
- Construction of a new swimming pool in Phomolong;
- Establishment of public parks in Phomolong;
- Road construction and maintenance;
- Establishment of health infrastructure; and
- Other social infrastructure development

6.1.2 Negative impacts

As mentioned earlier, negative project impacts can elicit resistance from local populations and government, which can ultimately hamper the progress and success of a project. The proposed project can have several impacts on the socio-economic environment, which can in turn have significant negative spin-offs for the local population, if proactive identification and mitigation is not undertaken. Several such aspects were identified and are discussed in turn below.

6.1.2.1 Disruption of movement patterns

The proposed project might disrupt the daily movement patterns and lives of people due to increased traffic on local roads, especially on the R70 road which connects Hennenman and

Phomolong to other major urban centres in the area. This road is currently in bad condition and deteriorating. Additional heavy traffic caused by construction vehicles might increase the number of road accidents and cause further deterioration of the roads.

6.1.2.2 Nuisance effects related to blasting, noise and dust

The development of the proposed project will entail extensive construction and operational activities (see Section 3.1.4). The impacts of these activities on surrounding communities such as Phomolong might include:

- Noise and dust generated by vehicles, machinery and blasting activities;
- Safety impacts (not only because of increased traffic, but also due to the risk of community members and animals wandering onto the construction site); and
- Visual intrusion caused by construction activities and structures, which may impact negatively on the aesthetic character of the agricultural landscape.

It is likely that these impacts will be most pronounced for the Phomolong community, given their close proximity to the project site. Although these impacts should be assessed in separate specialist studies, it is important that they also be considered from a social perspective.

The developments planned between Phomolong and Hennenman and the current expansion of informal settlements towards the project site should be considered during the mine planning and the establishment of ancillary infrastructure.

6.1.2.3 Influx related impacts

Large development projects offer people the opportunity to be employed. As news regarding the proposed project spreads, expectations regarding possible employment opportunities will take root. Consequently, the areas surrounding the proposed project might experience an additional influx of job seekers. Job seekers are likely to travel from neighbouring towns such as Welkom, Ventersburg and informal settlements near these urban centres. The pull factor for job-seekers to the area will be intensified by the high unemployment rate. As was mentioned in Section 5.1 and 5.2 poverty and unemployment are major challenges within the district and local study area.

Influx from other informal settlements to Phomolong can also be anticipated as this community offers low living and housing costs and it is close to the proposed project site. Large numbers of people that have been retrenched in the mining sector in other nearby communities might contribute to the influx of people to the study area. Furthermore, since part of the construction workforce will probably originate from outside the local area (due to the short supply of appropriately skilled workers locally and construction contractors preferring to use their existing staff), their presence will constitute an *additional* influx of people.

The influx of job-seekers and construction workers can have a variety of social consequences on the local population:

- Firstly it is possible that *conflict* might arise between the newcomers and local residents. One reason for such conflict would be the perception among locals that the outsiders are taking up jobs that could have gone to unemployed members of the local communities such as Phomolong or Hennenman. Some of Phomolong's population consists of migrants from other countries (see Section 5.2.2.2). Since there has in the past been violence between locals and foreigners, it may take root again when the Ventersburg project starts. However, it is not likely to be substantial since most foreigners appear to own their own businesses and are therefore likely to employ their family members.
- Substantial population influx might place significant *pressure on local infrastructure and services*, such as sanitation and road infrastructure, which is already taking strain. The increase in migrants may result in an increased demand for shelter and probably exacerbate the existing housing shortages in areas such as Phomolong. An increase in housing demand might accelerate the growth of the informal section of the township.
- Escalating demands might also be placed on limited *health services* with the predicted influx of people to the area.
- An influx of job-seekers may also lead to an increase in various *social pathologies*, such as drug and alcohol abuse, domestic violence, and the incidence of sexually transmitted diseases (STDs). As indicated in Section 0 and 5.2.2.4, HIV/AIDS has already attained worrying proportions in the study area, especially within Phomolong. This impact may be aggravated by the presence of a temporary construction workforce.

6.1.2.4 Impacts relating to construction camps

As mentioned in Section 3, it is expected that a considerable proportion of the construction workforce of the proposed project will be housed in construction camps that may be established in a dedicated area near the proposed project footprint.

As was discussed earlier in this section, construction camps can have several negative social impacts on surrounding communities, and also pose security-related risks. In addition to the social pathologies discussed in the preceding section, specific potential impacts in this regard include the following:

- Construction camps are predominately inhabited by single men who can often create social disturbances, usually as a result of drinking and or being away from their wives or girlfriends;
- Negligent behaviour, such as littering cigarette butts, causing veld fires;
- Loss of livestock due to poaching by construction workers;
- Littering by construction workers; and

- Once construction is complete and the camp is vacated, it may be illegally occupied by squatters. This risk is especially acute given the housing shortage in Phomolong.

If a construction camp is to be erected, potential sites for the construction camp should be investigated so as to maximise integration with existing services, ease of access for construction workers to the site, safety of workers while travelling between site and the camp, as well as to avoid intrusion or nuisance impacts on nearby households. The appropriate location of the construction camp should be considered by engineers. If the construction camp requires significant servicing from the local municipalities, this should be discussed with them in advance.

6.1.2.5 Land use – physical and economic displacement

The proposed mine will be situated on an existing commercial farm. Several land uses on this farm and on adjoining properties will be affected by the proposed development. This includes the *displacement* of persons residing on or making use of the land. Displacement-related impacts encompass both *physical* displacement (the loss of a home and the necessity of moving elsewhere) and/or *economic* displacement (the loss of productive assets such as cultivated fields or business stands as well as loss of employment due to the loss of these assets).

The proposed development will likely result in the Vogel household being physically and economically displaced as the construction of the mine on the property will force the family to move, which will also mean that they cannot practise their livelihood activity at its current location anymore. Selling and moving away from family land, which in this case has been kept within the Vogel family for several generations, can be traumatic if one considers the sentiment towards these types of family farms in general.

Apart from the family residing in the primary residence on the property, several farm employees will also lose their jobs and homesteads if the main farming operation is discontinued. This will result in the physical and economic displacement of the landowners' workers too.

6.1.3 Cumulative impacts

Cumulative impacts are defined as impacts arising from the combined effects of two or more projects or actions. The importance of identifying and assessing cumulative impacts is that the whole is often greater than the sum of its parts – implying that the total effect of multiple stressors or change processes acting simultaneously on a system may be greater than the sum of their effects when acting in isolation. Cumulative impacts usually relate to large-scale rather than site-specific impacts and have a tendency to increase the intensity of impacts already predicted for the proposed project.

Given the nature of the proposed project and the absence of other major developments in relative proximity to the immediate socio-economic environment, no cumulative socio-economic impacts are foreseen at this stage. More in-depth investigations would, however, need to be conducted during the impact assessment phase to consolidate this assumption.

6.2 Risk and constraints

Apart from the impacts described in the previous section the following aspects constitute constraints that might pose more immediate risks to the progress of the project. These risks should be incorporated into the project design and receive appropriate management and mitigation.

6.2.1 Community opposition and expectations

Community expectations regarding the proposed project are most frequently related to employment and corporate social investment projects. When such hopes are not met with interventions or addressed with appropriate communication, it may lead to potential stakeholder opposition and public mobilization against the project.

6.2.1.1 Social unrest

Phomolong community has in the past mobilized into protest action regarding service delivery and other aspects. This indicates that volatile elements exist in the township. Currently access to basic sanitation and health services is limited; if this situation deteriorates it might eventually reignite hostility in Phomolong.

This potential for local instability should be taken into account together with the recent nationwide mining strikes, particularly in the gold mining sector, which have also spilled over to mines near the study area. Community members may have a negative attitude towards the gold mining sector as they may have spouses, friends or relatives that have been retrenched or treated unjustly by other gold mining operations in areas such as Welkom and Virginia, particularly in light of the recent mine closures.

When combining these dynamics it can be argued that affected communities might become resistant or hostile towards the proposed project, if not treated in a socially justifiable manner.

6.2.1.2 Employment, procurement and CSI initiatives

Gold One intends to source a large proportion of their manual and semi-skilled labour force from the local areas (see Section 3.1.4). This is a considerable positive spin-off of the project because employment will provide opportunities for local people to be trained and gain exposure. It is important that the mine achieve its local employment targets, as failure to do so may result in political instability amongst communities.

The mine should caution against employing the majority of their local employment quota from other areas near Welkom, Virginia and Ventersburg. Communities such as Phomolong who are closer to the project site will feel that they are entitled to more opportunities, as they will be directly affected by many of the project impacts. The high unemployment rate in the Phomolong will contribute to any such sentiments.

Communities living around mines are generally well acquainted with the obligations that mining companies have to develop those and other labour sending communities through

corporate social investment and social and labour plans (SLP). Gold One should from the onset involve community structures and the local municipality in the development of local economic development programmes. Gold One should also consider conducting a needs assessment to determine the types of investments it can make to local development. Oftentimes there are already initiatives underway, in need of some financial or technical support that the mine could provide.

6.2.2 Displacement related compensation

The project footprint will cause both physical and economic displacement of several households. It is likely that at least some of the households located on the proposed project site will have to be physically displaced. The exact extent of such displacement can however, only be assessed once the infrastructure layout has been determined. Decisions regarding infrastructure placement should be made in consultation with the Social Assessment team, so as to avoid resettlement wherever possible.

The project is likely to involve *economic* displacement due to the loss of arable land and the loss of employment of farm workers. The loss of employment and land will necessitate the provision of livelihood restoration for farmworkers. Several issues might complicate the resettlement process. First, farmworkers residing on the property are not legal owners of the land, which is owned by the Vogel family. Secondly, Mr Vogel might be unwilling to part only with a section of his land, and can demand that he be compensated for the entire property. Compensation and resettlement should be finalised before the project is implemented. This will require that a resettlement action plan (RAP) be developed.

7 WAY FORWARD

The objectives of this concluding section are to summarize potential socio-economic impacts and risks associated with the proposed project and to identify additional studies that would have to be undertaken during future phases of the project. Table 31 summarises the potential impacts and risks identified in Section 6 of this report.

Table 31: Summary of potential impacts and risks

Positive impacts
Impact on the local economy
Employment opportunities
Local socio-economic opportunities
Negative impacts
Disruption of daily movement patterns
Nuisance effects related to blasting, noise and dust
Influx related impacts: ▪ Social conflict/ unrest ▪ Pressure on infrastructure/ services ▪ Social pathologies (crime, drug/ alcohol abuse, HIV, etc.)
Impacts related to construction camps
Land use – physical and economic displacement
Risk and constraints
Risks related to community opposition and expectations
Displacement-related compensation

It was pointed out in Section 1 that, should the feasibility phase of the project be successful, the project will proceed to a stage where applications for a variety of legal authorization processes will be submitted. During this phase, it is likely that a full Environmental Impact Assessment (EIA) would also have to be submitted. The EIA will include a social impact assessment (SIA) that will assess the anticipated impacts of the project on the human environment and to formulate appropriate mitigation measures to avoid or ameliorate negative socio-economic impacts and enhance positive ones.

The assessment of several of the anticipated social impacts will be informed by the findings of biophysical and other specialist studies. For example construction traffic volumes and associated safety impacts will be informed by the traffic specialist study; dust generation by the air quality study; and safety issues in the risk assessment.

Given that the project will probably involve physical and economic displacement (see Section 6.2.1.1 above), it is also likely that a Resettlement Action Plan (RAP) would be required to define measures to manage and mitigate displacement-related impacts.

The risks listed in Table 31 above constitute constraints that would have to be considered in project design, and/or require appropriate management and mitigation before the proposed project is implemented. Risks associated with community expectations and compensation

should be resolved during future stakeholder consultation and community engagement and, if possible, included in the risk assessment.

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Appendix A: Expertise of Specialist

JURIE ERWEE

Mr. Jurie Johannes Jacobus Erwee

Social Sciences Consultant

Social Sciences Department

Digby Wells Environmental

1 EDUCATION

2007	BA (Specialisation is Psychology), University of Pretoria, South Africa
2008	BSoc Sci (Honours) (Psychology) *Cum Laude*, University of Pretoria, South Africa
2009	MA (Research Psychology 1) *Cum Laude*, University of Pretoria, South Africa

2 LANGUAGE SKILLS

Language	**Reading**	**Speaking**	**Writing**
English	Excellent	Excellent	Excellent
Afrikaans	Excellent	Excellent	Excellent

3 EMPLOYMENT

2012 – Date	Digby Wells Environmental, Social Science Consultant
2009 – 2012	Aurecon, Junior Social Scientist

2008 – 2008	AURUM (Health Research Institute), Field researcher
2008 – 2008	University of Pretoria, Project manager

4 EXPERIENCE

I am a social scientist with 5 years of experience ranging over several aspects of social research, including the planning and execution of social surveys, participatory rural appraisal, sustainable livelihoods assessments, data management and statistical analysis, capturing and management of spatial data, stakeholder identification and community facilitation. Most of my work has been in the field of social impact assessment, resettlement planning and stakeholder engagement. I have been involved in projects in South Africa and elsewhere in Africa, including Namibia and Malawi.

I have attained a BA and honours degree in psychology at the University of Pretoria and I am registered as a student research psychologist at the Health Professions Council of South Africa. I have also completed my first academic year of Master studies in Research Psychology. Currently I am completing my Master's dissertation in the field of Cross-Cultural personality assessment in South Africa.

DIGBY WELLS
ENVIRONMENTAL

JURIE ERWEE

5 PROJECT EXPERIENCE

Project Title	Project Location	Date:	Description of the Project	Own role in the Project	Name of Client
RAP for Cluff Seguenega gold project	Burkina Faso	2012-2013	Resettlement Action Plan	Planning and implementation of asset and infrastructure surveys; Resolving agricultural field conflicts; Stakeholder engagement;	Cluff Gold PLC
Mega African Holdings – Lengau IPP coal fired Power Project	South Africa	2012	EIA for proposed 300 - 1600MW coal fired IPP	Secondary Data collection; Data analysis; Report writing	Mega African Holdings
Gold One Ventersburg Gold Mine Project	South Africa	2012	Bankable Feasibility Study for the proposed Ventersburg Gold Mine	Initiating stakeholder contact; arranging and conducting rapid appraisal interviews and focus groups; public participation; data analysis and report writing	Gold One Africa Ltd
ESIA for Cluff Seguenega gold project	Burkina Faso	2012	Environmental impact assessment, social baseline report, social impact assessment report	Report writing: Socio-economic Baseline;	Cluff Gold PLC
Tonguma Exploration Project	Sierra Leone	2012	Environmental impact assessment, social baseline report, social impact assessment report	Selection of sampling areas; Questionnaire development; fieldwork training; managing and implementing the survey; managing GPS data; arranging and conducting rapid appraisal interviews and focus groups; public participation; data analysis and report writing	Koidu Holdings Ltd.

Project Title	Project Location	Date:	Description of the Project	Own role in the Project	Name of Client
Platreef Skills and Business Electronic Survey	South Africa	2012	Development of a Skill and Business Database for the Platreef Mine	Questionnaire development; Advertisement development; enumerator training; managing and implementing the survey; stakeholder contact; data analysis and report writing	Platreef Resources Ltd.
Kibali Cost of Living Assessment	Democratic Republic of Congo	2012	Assessment of Changes in daily living cost	Questionnaire development; Data capturing and analysis; Report Writing	Randgold Resources Ltd.
Nampower Erongo coal fired power station	Namibia	2012	Social baseline report & social impact assessment report	Data Analysis ;Report writing	Nampower
Mbewu – Isundu 400kV Power Line Project	South Africa	2011	Social baseline report	Report writing	Mbewu – Isundu
EIA for the Afrisam cement plant and associated infrastructure	South Africa	2011	Environmental impact assessment, social baseline report, social impact assessment report	Report writing	Afrisam
Olifants River Water Resources Development Project (ORWRDP)	South Africa	2010	Resettlement action planning	Initiating stakeholder contact; managing the public participation process; planning and implementation of asset and infrastructure surveys; implementation and planning of landowner identification; execution of the photographic survey; and involved with resettlement action planning.	TCTA

Project Title	Project Location	Date:	Description of the Project	Own role in the Project	Name of Client
Malawi Rail Corridor Southern and Central Malawi	Malawi	2010	Social impact assessment	Induction training; responsible for managing and implementing socio-demographic survey; fieldwork supervisor and fieldwork training; managing survey, GPS and qualitative data; managing general survey logistics; conduction rapid appraisal interviews and focus groups via interpreters; and stakeholder contact in a foreign environment	Vale
Cradle of Humankind and Dinokeng Projects	South Africa	2009	Socio-economic impact assessment survey	Selection of sampling areas and ground trothing; arranging and implementing fieldwork recruitment; fieldwork training; managing and implementing the survey of 2000 households; managing GPS data; arranging and conducting rapid appraisal interviews and focus groups; stakeholder contact; data analysis and report writing; compiling presentations; managing and implementing a tourism survey; and writing a tourism survey report	Gauteng Provincial Government

6 PROFESSIONAL AFFILIATIONS

N/A

7 PROFESSIONAL REGISTRATION

Member: Health Professions Council of South Africa - PS S 0105082

8 PUBLICATIONS

N/A

APPENDIX 15

SOCIO-ECONOMIC STUDY (2017)

2017

Socio-Economic Impact Assessment of the Proposed Ventersburg Gold Mine

Submitted to:

prime | resources
environmental
consultants

The Workshop, 70 7th Ave, Parktown North, Johannesburg, South Africa.

February 2017

EXECUTIVE SUMMARY

Turnscapes Travel and Tourism Pty Ltd (Turnscapes) was appointed by Prime Resources Pty Ltd to undertake the Socio-Economic Impact Assessment (SEIA) and Socio-Economic Mitigation and Monitoring Plan (SEMMP), which forms a part of the Environmental Impact Assessment (EIA) Process that Prime Resources is conducting for the proposed Gold One Africa Limited ("Gold One") Ventersburg Project, in the Free State Province of South Africa.

The proposed project is located in Ward 3 of the Matjhabeng Local Municipality (MLM), which is a part of the larger context of the Lejweleputswa District Municipality (LDM) of the Free State. Furthermore, Gold One has prospecting rights that are positioned on farms between the Ventersburg and Hennenman localities where the proposed underground gold mining operation would be considered to occur. The operational phase of the mine is expected to be 13 years that would proceed after an anticipated four years of construction, which would start in 2021.

The mining of gold and its associated activities is dominantly comprised of the mining and processing of the rock, which requires the establishment of underground and surface infrastructure. The procedures involved with the formation and functioning of a mine results in impacts that can be positive and negative. The fundamental purpose of this document is to identify anticipated positive and negative impacts of the proposed project, to present mitigation and management measures and recommendations in that regard. This process has been guided by the global suggestions of the International Guidelines for Social Impact Assessment published in 2012.

Any SEIA falls within a legislative context, and the laws relevant to are:

- Constitution of the Republic of South Africa (Act No. 108 of 1996);
- Extension of Security of Tenure Act, 1997 (Act No. 62, 1997);
- Promotion of Administration Justice Act (No. 3 of 2000);
- Development Facilitation Act (No. 67 of 1995);
- National environmental Management Act (No. 107 of 1998);
- National Water Act (No. 36 of 1998);
- Scorecard for the Broad Based Socio-Economic Empowerment Charter for the South African Mining Industry (Notice 1639 of 2004);
- Mineral and Petroleum Resources Development Act 2002 (Act No. 28 of 2002).

The methodology of this SEIA involved the clarity in the scope of the project, review of relevant literature, collection of primary and secondary data, analysis of primary and secondary data which characteristically forms the formation of the baseline of the report and is reflected in Section 3. The analysis of impacts is addressed and explored in isolation in Section 4.

The core socio-economic conditions that have been taken into consideration are related to the Lejweleputswa District Municipality (LDM) and the Matjhabeng District Municipality (MLM). The LDM currently has a profile that is displaying a declining population and an unemployment rate of 36,5%. The services of waste removal are declining, but there is a rise in the level of education as well as the access to sanitation. The MLM has the highest unemployment rate in the District Municipality of close to 40% where 46% of the youth remain unemployed in the larger district.

It is apparent in the MLM that the spread of the population is saturated to urban areas. The majority of the population has a Primary School education. Main dwelling types are brick houses or informal houses where the large majority of the population have access to a chemical toilet and therefore have access to sanitation facilities as well as to piped water. Mining is a large contributor to the local economy in the MLM but the use of the land is mainly attributed to farming activities.

The socio-economic environment on a local level is one that has several stakeholders. They are people of the community of Hennenman, Ventersburg, Phomolong Township, Whites Community and the Farming Community located between the towns of Hennenman and Ventersburg. These stakeholders are within what is described as the "social area of influence" of the proposed project. Each of these communities displays different characteristics which are explored in Section 4. A scenario approach was undertaken in the analyzing of impacts which addressed the scenario of Mr. Vogel and the farmworkers that reside on his property remaining in the dwellings (Scenario i) and where Mr. Vogel and the farmworkers vacate the property (Scenario ii). General impacts that would affect remaining stakeholders were addressed in a general section.

Following the above, there was a range of impacts that were identified on these stakeholder communities, which are also receptors of the anticipated effects of the proposed project. All the impacts are addressed in Section 4 however the core impacts are introduced below.

The core positive impacts of the intended project are:

- Employment opportunities;
- Possible alleviation of poverty levels;
- Possible transformation of culture of youth;
- Community projects that could allow for transition into other skills in the area.

The core negative impacts of the intended project are:

- Devaluing of properties surrounding the intended mine;
- Reduced quality of life (for stakeholders in scenario (i));
- Physical displacement of farmer and farmworkers directly affected (for stakeholders in scenario (ii));
- In-migration of people and workers;
- Pressure on infrastructure from influx and overcrowding;
- Decrease in quality of life of stakeholders surrounding the footprint of mine;
- Impact on land use of Mr. Vogel's land (for stakeholders in scenario (ii)).

It would be imperative to the mitigation and management of the negative impacts that the mitigation measures and programs specified are carried out.

There were no fatal flaws indicated in the project however the ethical considerations and imperatives of this project are stipulated in the conclusion section.

DETAILS OF THE SPECIALIST

Prepared by:

Ms. Chanel Emily Turner

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Email: chanel@turnscapes.co.za

Miss Chanel Emily Turner was born in South African but has extensive influences from Tanzania and Ghana that form a part of her upbringing. She is currently the Managing Director of Turnscapes Travel and Tourism. Working mostly as a Social Impact and Tourism Impact Practitioner, she obtained a Bachelor of Historical and Cultural Science with specialization in Heritage and Cultural Tourism Honours Degree at the University of Pretoria, which was attained with distinction and Academic Honourary Colours, making her a member of the Golden Key International Honour Society. She is furthermore extending her knowledge in these fields by pursuing a Master's Degree on a part-time basis.

She has experience dealing with impacts associated with development from both a social and tourism viewpoint. She has worked on different type of projects connected to the analysis of impacts such as those for heritage organizations, power-line projects and housing developments that have been the base of her experience as a Social Impact Specialist and Tourism Assessment Specialist. Her favourite part of the impact assessment processes is fieldwork where she is passionate about seeing the intricacies of the social and tourism environments.

Declaration of Independence

This confirms that Chanel Emily Turner, the specialist who has prepared this Socio-Economic Impact Assessment Study is independent and has no vested interests in the project at hand. The signed document features in Appendices A.

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LIST OF ACRONYMS

Acronym	
Turnscapes	Turnscapes Travel and Tourism Pty Ltd
Gold One	Gold One Africa Limited
SEIA	Socio Economic Impact Assessment
EIA	Environmental Impact Assessment
MLM	Matjhabeng Local Municipality
LDM	Lejweleputswa District Municipality
IFC	International Finance Corporation
IAIA	International Association of Impact Assessment
SLP	Social Labour Plan
EIA	Environmental Impact Assessment
SMP	Social Management Plan
PS	Performance Standard
STD	Sexually Transmitted Disease
TB	Tuberculosis
SLO	Social License to Operate
SEMMP	Socio Economic Management and Monitoring Plan
CDP	Community Development Program
SLP	Social and Labour Plan
LOM	Life of Mine
DMR	Department of Mineral Resources
TSF	Tailings Storage Facility
WRD	Waste Rock Dump
NAAQS	National Ambient Air Quality Standards
SANS	South African National Standards

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SOCIO-ECONOMIC IMPACT ASSESSMENT FOR THE PROPOSED VENTERSBURG GOLD MINE, FREE STATE PROVINCE, SOUTH AFRICA

1. INTRODUCTION

1.1. Background

Gold mining has played a large role in the history of the development of the South African economy from its discovery in 1886 and is still a sector that contributes to the economy. With the aging mining infrastructure and depleting gold mining deposits, exploration for gold in new localities in the South African environment is sought after.

Following the above, Gold One Africa Limited (Gold One) is exploring the option of gold mining between the towns of Hennenman and Ventersburg in the Free State province, South Africa. The prospecting for gold was undertaken in 2012 once prospecting rights were issued to Gold One by the Department of Mineral Resources (DMR). In 2013, Digby Wells Environmental (Digby Wells) undertook a Socio-Economic Baseline Assessment for the Feasibility Study for the Proposed Ventersburg Mine, which is needed to be updated given the time that has passed to date. The updating of the information serves as one of the purposes of this Socio-Economic Impact Assessment (SEIA).

In South Africa, it is required by law that before development such as a mine occurs, that an Environmental Impact Assessment (EIA) is conducted. Turnscapes Travel and Tourism Pty Ltd (Turnscapes) was appointed by Prime Resources in December 2016 to undertake the SIA, which would include the updating of baseline information, the investigating of the legislative environment, impact assessment section and the exploration of core impacts identified in the previous report of 2013, as well as a Social Management Plan (SMP) as the key sections that will be addressed in the report.

The purpose of this report is providing an understanding of the social environment in which the project would occur, from both a social and economic perspective; to anticipate some of the impacts that would occur should a gold mine be opened and effective strategies to manage the social environment in the future.

1.2. Location of the project

The project is located between the towns of Hennenman and Ventersburg in the Matjhabeng Local Municipality (MLM) of the Free State Province in South Africa. The broader district municipality that it falls within is the Lejweleputswa District Municipality.

Figure 1 below is an indication of the different wards that form a part of the MLM and the area of relevance in this report is dominantly the area represented in yellow, which is Ward 3 however Ward 1 indicated in purple is also an area that is positioned as one that needs to be considered in terms of impacts.

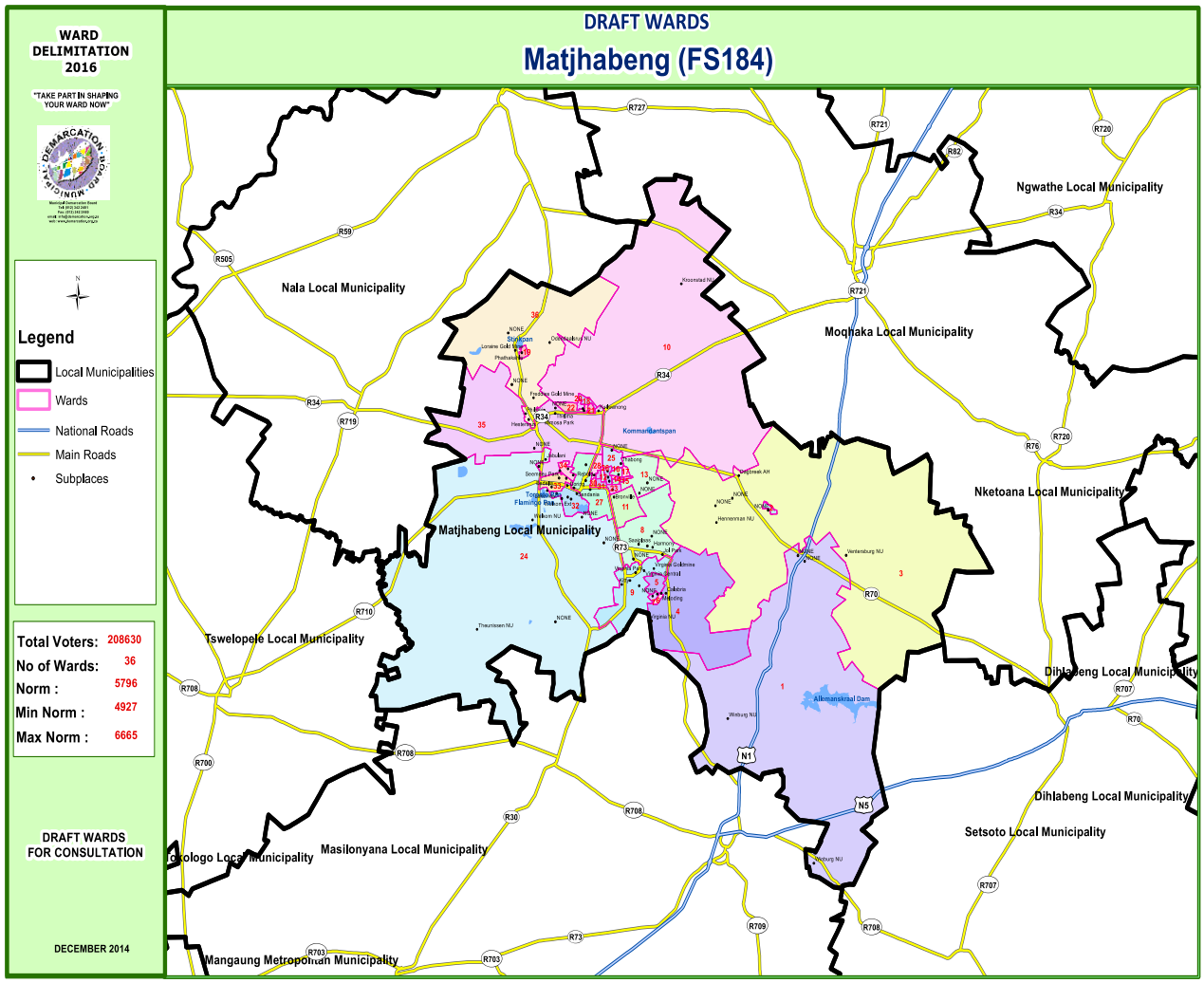


Figure 1: Boundaries of wards in Matjhabeng Local Municipality 2016

1.3. Project description

Gold One Africa Limited ("Gold One") holds five contiguous prospecting rights (DMR Reference: FS 10140 PR, FS 10228 PR, FS 10229 PR, FS 10087 PR and FS 10080 PR) over various farm portions (between the towns of Hennenman and Ventersburg in the Free State) and proposes to develop an underground mining operation - the proposed Ventersburg Project.

The life of mine of the proposed Ventersburg Project is expected to be 17 years including four years for construction. Planned commencement of construction is estimated to be in 2021. It is assumed

that mining operations will commence in the year 2025 and will continue for 13 years, until the year 2038.

Mining

The proposed Ventersburg Project will comprise of a main shaft and ventilation shaft. The Run of Mine (RoM) ore and the waste rock will be hoisted separately at the Main Shaft. Full production will be reached in year 9 at 80,000 tonnes of RoM ore per month which will be maintained for seven years. An estimated 30,000 tonnes of waste rock will be generated per month at steady state.

The ore and/or waste rock will be fed from the shaft headgear bin, and conveyed to the processing plant, while waste rock will be conveyed to the waste rock dump. Waste rock hoisted through the ventilation shaft will be trucked to the waste rock dump.

Prior to the commissioning of the processing plant, RoM ore will be trucked from the shaft headgear bin to the ore emergency/commissioning stockpile. Once the processing plant has been commissioned, ore will be reclaimed from the ore emergency/commissioning stockpile with a front-end loader and fed onto the conveyor to be transported to the processing plant.

Groundwater in the underground workings will be dewatered and pumped to surface to be treated at a water treatment facility. The treated excess water will be discharged to the Rietspruit via a pipeline. Excess water is to be treated to discharge standards (to be stipulated by the Department of Water and Sanitation) and will therefore be considered as clean water. The maximum volume of treated water to be discharged is 6 Mℓ per day at steady state for 13 years, with a ramp up of between 1 and 3 Mℓ per day for the first four years during construction.

Processing

The processing plant will operate continuously and involve the crushing of ore, the removal of the gold from the crushed ore through a chemical extraction process producing concentrate, the refining of the concentrate through electrolysis and the smelting of the gold in a furnace for the casting of gold bullions. Tailings from the processing plant will be disposed of on a tailings storage facility.

Surface Infrastructure

The extent of the proposed surface infrastructure associated with the proposed Ventersburg Project is approximately 250 ha and comprises:

- Main shaft, conveyor transfer houses and conveyor systems, ventilation shaft, workshops, stores, salvage yard, waste transfer area, power lines and substations, topsoil stockpile, pipeline network, office and administrative buildings, processing plant, bulk fuel storage facility, emulsion storage silos and on site access and haul roads.

- Mining material and waste infrastructure to be constructed includes such an emergency/commissioning ore stockpile, waste rock dump (WRD) and tailings storage facility (TSF) (which will be lined as per legislative requirements and equipped with pollution control infrastructure).
- Water management infrastructure includes various dams, pollution control infrastructure, water treatment facility and pipeline to discharge treated water to the Rietspruit.

After operations cease, decommissioning will commence. A period of 1 year has been assumed for decommissioning and rehabilitation, during which all the surface infrastructure components aside from the TSF and WRD will be removed and the disturbed areas rehabilitated.

Figure 2 below indicates the surface infrastructure that would be intended.

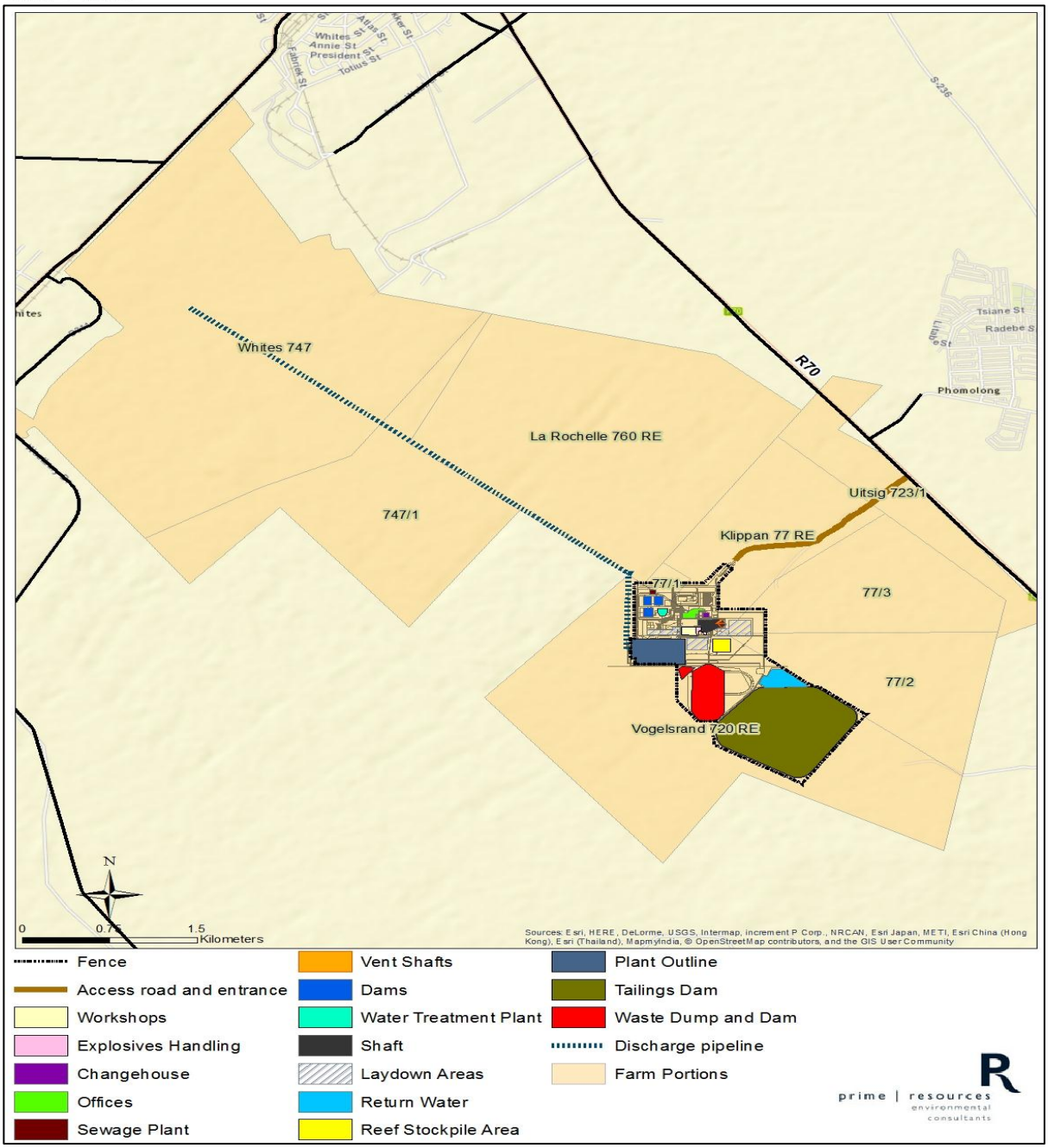


Figure 2: Ventersburg Project Layout

1.4. Aims of the report

The main aims of the report are as follows:

- To formulate a clear understanding of the social environment within the study area;
- To raise the possible impacts of a positive and negative characteristic that may become apparent as a result of the intended project;
- To present key findings;
- To indicate the conclusions and recommendations;

- To produce a Management Plan that would assist in the enhancing of positive impacts and the management of negative impacts to enable an effective social system in the future.

1.5. Social objectives

The key social objectives are:

- Development should take place in a way that it can be considered sustainable;
- If the livelihoods and ways of life of local communities are affected, that they would be restored;
- The growth of the area would enrich the social system of the communities that surround the project.

1.6. Principles that guide the report

The key principles from a global perspective that are considered important stem from Frank Vanclay's "*SIA Principles: International Principles for Social Impact Assessment*" from the Impact Assessment and Project Appraisal, Volume 21, number 1, March 2003, pages 5-11, Beech Tree Publishing for the International Association of Impact Assessment.

There are 12 principles that should guide the report that are particular to the SEIA context:

- Fairness as a core component in all aspects of the process and reporting;
- The large majority of effects of a social nature can be foreseen;
- Endeavours can be altered such that the detrimental effects can be diminished and the beneficial effects formed;
- The SIA must play a key role in the growth endeavour and therefore present all phases of the project;
- Emphasis on "socially sustainable development" should occur where the SIA adds value in the decision making of optimal growth options or "alternatives";
- In the carrying out of processes and reporting, methods formed to develop the "social and human capital of local communities and to strengthen democratic process" should be examined;
- The way in which people who are affected by the respective project can receive positive effects needs to be explored;
- "Alternatives" of the respective project should be carefully considered from the SIA perspective, and particularly where there are "unavoidable impacts";
- Attention should be paid to possible mitigation methods;
- The information on the ground and that of the indigenous people of the area and respect for the societies' principles should be implemented and included in the report;
- All processes and reporting should be done in harmonious ways;
- The rights of people should be protected and guide behaviour.[1]

1.7. Definitions

[1] Vanclay,2003

The concepts that are valuable to the social environment in which the impacts occur and the core ideas explained used in this report are indicated as follows:

- Social impacts;
- The Socio Economic Impact Assessment;
- Social change processes;
- Sense of place;
- Place attachment;
- Sense of community;
- Stakeholders;
- Grievance mechanism;
- Economic displacement;
- Physical displacement;
- Fatal flaws and red flags.

Social impacts are considered as effects that manifest directly on people that can cause a change in their individual culture where the scale of change can exist personally, within the context of a support system or group of people.[2] Social impacts can be expressed in more detail with the use of Vanclay's definition which defines them as:

> "The consequences to human populations of any public or private actions (these include policies, programs, plans and/or projects) that alter the ways in which people live, work, play, relate to one another, organize to meet their needs and generally live and cope as members of society. These impacts are felt at various levels, including individual level, family or household level, community, organization or society level. Some impacts are felt by the body as a physical reality, while other social impacts are perceptual or emotional". [3]

The effects of development are unique to the setting and the project at hand.[4] This essentially implies that the social impacts are the effects of development that appear in different intensities and respectively different ways-they are also particular to the context.

Following the above, there are numerous definitions of the **Social Impact Assessment**, however, one from Vanclay is used and described as:

> "The process of analyzing, monitoring and managing the intended and unintended social consequences, both positive and negative of planned interventions (policies, programs, plans, and projects) and any social change processes invoked by those interventions. Its primary purpose is to bring about a more sustainable and equitable biophysical and human environment". [5]

In the case of the **Socio-Economic Impact Assessment**, this would be extended to the economic environment as well.

[2] Vanclay, 2002.
[3] Vanclay, 2002.
[4] Vanclay, 2002.
[5] Vanclay, 2006.

It is therefore valuable to clarify the meaning of "**social change processes**," as a shift that occurs which alters the traits a community considers as a part of their identity. It generally takes place irrespective of what particular setting is at hand and in some cases related to particular case studies, can spur on social impacts.[6]

'**Sense of place'** is a concept that involves a person's bond or association with a site and the personal interpretation of it as such.[7] It can also be explained as:

> "An individual's personal connection to and sensory experience of a built or biophysical place as understood through meanings given to its characteristics. These include built landmarks/location, biophysical landmarks/features, spots of emotional significance and the social/community environment".[8]

'**Place attachment'** refers to the level in which a person has a connection to the site.[9] In a more detailed sense it can be defined as:

> "The environmental settings to which people are emotionally and culturally attached, to varying degrees in a positive sense. Attachments to places are developed through interaction with or experience of them regularly and over time, or through story-telling about and memory of them".[10]

'**Sense of community'** is best explained by the following definition:

> "An individual's personal feeling of being recognized and included in a community based on their experience of membership, and factors identified by that individual that give them a sense of community membership. These can include way of life, norms and social order, interaction and relationships among members, long-term residence, and participating in events".[11]

The definitions addressed lead one to the important concept of "**stakeholders**", who are considered as:

> "Any individual, group, or institution who has a vested interest in the natural resources of the project area and/or who potentially will be affected by project activities and have something to gain or lose if conditions change or stay the same".[12]

This definition can also be applied to the social context of a given project.

A **grievance mechanism** is a system or procedure that is created to consult with and resolve unrest or queries of the stakeholders of a development endeavour where they perceive effects on themselves or their work, which is not positive in nature.[13]

[6] Vanclay, 2003.
[7] Baldwin, 2015.
[8] Baldwin, 2015.
[9] Baldwin, 2015.
[10] Baldwin, 2015.
[11] Baldwin, 2015.
[12] WWF, 2005.
[13] IAIA, 2012.

"**Economic displacement**" is the effects of a social nature that are evident because of the "loss of economic livelihood". This is different to "**physical displacement**" is defined as "the loss of housing resulting from project-related acquisition of land and/or restrictions to landuse that require the affected persons to move to another location".[14]

Lastly, it is important in any Impact Assessment, that the concept of a fatal flaw and a red flag is raised.

> A **fatal flaw** is defined as "a significant long-term negative consequence on the affected social environment that is extremely difficult to mitigate or undesirable to promote".[15] Whilst a **red flag** is can be explained as "a potentially serious impact that could have medium – to long-term negative consequences on the affect social of biophysical environments that can only be mitigated at significant will, effort and cost".[16]

1.8. Methodology

There are conventionally two approaches to an SIA, either a participatory or a technical methodology and both methodologies will be briefly explained for clarity.

A participatory methodology draws the knowledge of the local people in the respective social setting of the project area into account such that the local knowledge of the area is utilized. It is enabled in such a manner that the SIA specialist gathers information on the anticipated impacts from the key identified stakeholders in the study area. Therefore, the function of the specialist in this type of approach is to enable and encourage people to impart knowledge and perceptions, and for it to be considered in the study.[17]

This is different in characteristic to a technical methodology where the focus is on observation of the social environment as well as scientific information. It involves the use of the specialist's choice of indicators that would assist with decisions and considerations of the way the social setting would alter.[18]

This SIA dominantly follows a participatory approach which gave insight into current social challenges of the communities involved as well as to the impacts and perceptions of the stakeholders in the study environment.

This methodology comprises of the following core elements in its execution:

- A clear scope of the project,
- Literature review,
- Analysis of primary and secondary data,
- Impact analysis discussion.

[14] IAIA, 2012.
[15] United Nations Environmental Program, 2007.
[16] United Nations Environmental Program, 2007.
[17] Becker, Harris, Nielson & Mclaughlin, 2004.
[18] Becker, Harris, Nielson & Mclaughlin, 2004.

1.8.1. Determining the scope of the project

The scope of the project is not only limited to the fixed boundaries and location of where the mining activity would be anticipated to be, but considers the surrounds of the project to a large degree as there is broader social context that is imperative to consider.

The scope of the project can also be explained as the study area of the SIA and according to the *IFC (2003) Good Practice Note: Addressing the Social Dimensions of Private Sector Projects*, the study area that is required to be considered in an impact assessment is the zone/s that is/ are anticipated to encounter effects due to a proposed endeavor that is under assessment.[19]

This means that there are three levels of the environment that can experience impacts, namely:

- The site itself;
- The surrounding local environment;
- The regional environment.

This is applicable to the context as the site includes the area that would be designated as the area for mining and its associated activities, as well as the immediate adjacent and neighboring communities and community members. This means that it would involve the affected and surrounding farmers, the Phomolong township, Ventersburg, Hennenman and Whites Community.
The surrounding local environment would refer to the Ward 1 and Ward 3 of the Matjhabeng Local Municipality. The regional environment would be relevant to the Matjhabeng Local Municipality in its entirety.

1.8.2. Literature review

The information that comprises of the literature review is that which is found in books, journals and public literature and contributes to the understanding of the setting and communities within it. The core documents that are used for the baseline of the report are from Local Economic Development Plans as well as Integrated Development Plans.

1.8.3. Collection and analysis of primary and secondary data

Primary data is characteristically collected by means of observation, questionnaires or interviews. Visits to the site were undertaken daily between the 16th- 20th January 2017 as well as the 8th February 2017; and furthermore, this SIA was informed by observations, interviews and focus groups with stakeholders of the intended project.

The consultative process took place between the 16th-20th January 2017 where interviews and discussions with core stakeholders were undertaken as a foundation of the participatory approach and attaining local information on the impacts that were perceived for the intended mine project. A channel for a grievance mechanism was set up by the SIA specialist for the core stakeholders that were consulted. This means that contact information of the specialist was given out to correspond

[19] IFC, 2003.

with the respective stakeholder if there were any concerns or grievances that we raised during the process of the SEIA.

The core interviews and focus groups were undertaken:

Date:	Group or association linked to the project	Position of person or respective farm portion:	Person consulted with:
17 January 2017	Farmer in direct surrounds affected	Farm portion: Onverwacht 342.	Mr. F. Coetzer
	Farmer directly affected and in surrounds	Farm portion: Whites 747.	Mr. W. Theron
	Farmer directly affected	Farm portions: RE Vogelsrand 720, Klippan 77, La Rochelle 760, Uitsig 723, Strydfontein 211.	Mr. F. Vogel
18 January 2017	Local Municipality	Ward Councillor Ward 3	Mr. C. Schlebusch
	Local Municipality	Unit and Area Manager	Mr. V. Xhabe
	Farmers Association in Hennenman	Chairman of Farmers Association in Hennenman	Mr. F. Coetzer
	Local Municipality	Ward Councillor Ventersburg	Mr. Sebotsa
	Kheleng Secondary School (Phomolong)	Principal	Mr. Mosia
19 January 2017	Kwetsa Public School (Phomolong)	Principal	Mr. J. Lenake
	Phomolong Police Station	Constable and police officers	Constable Matshabeng Ms. Mtolo
	Phomolong Clinic	Clinic Manager and Doctor	Mr. S. Mobele
	Bahle Secondary School (Phomolong)	Vice Principal	Mr. R. Mfuneli
	Tswelopele Creche	Teacher	Ms. E. Marumo
20 January 2017	Farmer in surrounds	Farm portion: Tweefontein 101	Mr. de Villiers
	Local Municipality	District Ward Councillor	Mr. Tshabangu
	Ventersburg Tourism Association	Chairperson and member of association	Mr. A. Lategan Mr. K. Rhode
	Ventersburg Farming Association and directly affected farmer	Chairperson Ventersburg Farming Association and farmer in surrounds. Farm portion: Strydfontein 211	Ms. E. Wessels
	Kalkvlakte Primary School	Teacher	Ms. S. Ntlemeza
8 February 2017	Beatrix Mine	Human Capital Superintendent	Mr. J. Miller

1.8.4. Analysis of secondary data

The analysis of secondary data is dominantly connected to the Integrated Development Plans and Local Economic Development Plans of the Matjhabeng Local Municipality and Lejweleputswa District Municipality. Respective strategies, plans, reviews and online sources were consulted and analyzed according to the value that they could add to the report.

1.8.5. Impact Analysis

The following risk assessment model will be used for determination of the *significance* of impacts as stipulated by Prime Resources.

SIGNIFICANCE = (MAGNITUDE + DURATION + SCALE) X PROBABILITY

The maximum potential value for significance of an impact is 100 points. Environmental impacts can therefore be rated as high, medium or low significance on the following basis:

- High environmental significance 60 – 100 points
- Medium environmental significance 30 – 59 points
- Low environmental significance 0 – 29 points

MAGNITUDE (M)	DURATION (D)
10 – Very high (or unknown)	5 – Permanent
8 – High	4 – Long-term (ceases at the end of operation)
6 – Moderate	3 – Medium-term (6-12 years)
4 – Low	2 – Short-term (0-5 years)
2 – Minor	1 – Immediate
SCALE (S)	**PROBABILITY (P)**
5 – International	5 – Definite (or unknown)
4 – National	4 – High probability
3 – Regional	3 – Medium probability
2 – Local	2 – Low probability
1 – Site	1 – Improbable
0 – None	0 – None

The quantification of impacts is calculated for each **phase** of the operation i.e. Construction, Operation, Decommissioning, Post-closure.

The impacts will be represented in the following table.

Impact Analysis table and Monitoring and Managing table:

Receptor/ Resource	Process/ Activity	Social Impact	Impact effect	Magnitude (M)	Duration (D)	Scale(S)	Probability (P)	Significance	
								Rating	Value

Impact Monitoring	
Monitoring	Time Frame for Monitoring

1.8.6. Assumptions and limitations

- The report is based on information that is currently available. This means that in terms of secondary data collected that appears in the baseline of the social environment section of the report, the information may not be for the year 2017. This is relevant and applicable to the Integrated Development Plans as well as data from StatsSA that may not be from the year 2017, however remains the latest data of that kind that is available.
- The information supplied by the client is assumed to be correct.
- It was not possible to interview and interact with every person who formed a part of the Interested and Affected Parties. Therefore, only people who were considered crucial to the study were interviewed.
- Since the social context is one that is dynamic and altering continuously, does not make social impacts easily quantifiable. However, effort has been put into the intended accuracy of measurement of the social impacts.
- It is assumed that the respective mitigation measures that were stipulated in the other specialists' reports consulted with, such as the Visual Aesthetics Impact Assessment, Blasting Assessment, Traffic Assessment, Groundwater and Surface water Impact Assessment, Air Quality study, Noise study and Radiation study, would be implemented. Therefore, the measurements of social impacts are considered in light of the execution of the mitigation measures of technical reports suggested.
- Certain social impacts have been anticipated on these above-mentioned specialist reports and they are therefore assumed to be correct.

1.8.7. Guidelines consulted

1.8.7.1. International Association of Impact Assessment (IAIA) Social Impact Assessment Guideline

The IAIA has produced a document called "Social Impact Assessment: Guidance for assessing and managing the social impacts of projects", which serves the purpose of allowing for a grasp of what best practice SIAs are comprised of and the respective processes which form a part of them.[20]

1.8.7.2. International Finance Corporation (IFC) Guidelines on Performance Standards

The IFC formed guidelines on Performance Standards (PS) in 2006 that was appraised in 2012, which has allowed for the establishment of a cluster of notions that are used in the international arena that have set a standard for global best practice. There are 8 Performance Standards that address different themes related to Impact Assessment, the ones relevant to this project are as follows. It's imperative to note that these are guidelines for the study and not implementation.

PS 1: Social and Environmental Assessment and Management System;
PS 2: Labour and Working Conditions;
PS 3: Pollution Prevention and Abatement;
PS 4: Community Health, Safety and Security;
PS 5: Land Acquisition and Involuntary Resettlement;
PS 8: Cultural Heritage.[21]

[20] IAIA SIA Guidelines, 2012.
[21] IFC, 2006.

2. LEGLISLATIVE ENVIRONMENT

Any project or development that occurs features within a legislative environment and the following laws need to be considered in the context of this SIA. It is important to briefly identify the broader legislative rights of the people within the country of the project and is a base understanding for the social impacts that may be explored in sections that follow in the report.

2.1. Constitution of the Republic of South Africa (act No. 108 of 1996)

The Constitution proclaims South Africa as a free, democratically governing country where the foundation on which it is built is "human dignity, non-racialism and non-sexism, supremacy of the constitution and rule of law" and consistent elections that allow for responsibility and transparency.

The Bill of Rights plays an important role in this document as it is considered to be central to the concept of democracy. It acknowledges that all people within the South African Environment have human rights and makes known the principles of "human dignity, equality and freedom".

It is also valuable to consider that there is a section addressing the Environment: Section 24 of Chapter 2 explains that every person has the right-

a) "To 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 generation, through reasonable legislative and other measures that-
   (i) prevent pollution and ecological degradation;
   (ii) promote conservation; and
   (iii) secure ecological sustainable development and use of natural resources while promoting justifiable economic and social development."

Another consideration is Section 26 of Chapter 2 that addresses housing:

a) "Everyone has the right to have access to adequate housing.
b) The state must take reasonable legislative and other measures, within its available resources, to achieve the progressive realization of this right.
c) No one may be evicted from their home, to have their home demolished, without an order of court made after considering all the relevant circumstances. No legislation may permit arbitrary evictions."

2.2. Extension of Security of Tenure Act, 1997 (Act No. 62, 1997)

The Extension of Security of Tenure Act of 1997 serves the purpose of:

- The provision of actions that allow for the encouragement of security of land tenure for longer periods of time;
- Providing governance on matters related to particular circumstances of land situations;

- Clarification on the situations where the rights of persons to live on land may be concluded (terminated);
- Clarification on matters where persons right to land is terminated, and can be evicted, the respective way it should be carried out.

The components of this Act that are most relevant to the project area and the anticipated impacts of the project are highlighted as follows.

The following definitions according to the Act are imperative to introduce.
An **"employee"** is that which is referred to in the Labour Relations Act. **"Consent"** means "express or tacit consent of the owner or person in charge of the land in question, and in relations to a proposed termination of the right of residence or eviction by a holder of mineral rights, includes the express or tacit of such holder". An "**occupier**" "means a person residing on land which belongs to another person, or who has or on 4 February 1997 or thereafter had consent or another right in law to do so, but excluding –

(a) A labour tenant in terms of the Land Reform (Labour Tenants) Acts, 1996 (Act No. 3 of 1996)".

Section 8 of the Act provides information of the Termination of right of residence. It states that:
8.(1) Subject to the provisions of this section, an occupier's rights of residence maybe terminated on any lawful ground, provided that such termination is just and equitable, having regard to all relevant favours and in particular to-
(a) the fairness of any agreement, provision in an agreement, or provision of law on which the owner or person in charge relies;
(b) the conduct of the parties in giving rise to the termination;
(c) the interests of the parties, including the comparative hardship to the owner or the person in charge, the occupier concerned, and any other occupier if the right of residence is or is not terminated;
(d) the existence of a reasonable expectation of the renewal of the agreement from which the right of residence arises, after the effluxion of its time;
(e) the fairness of the procedure followed by the owner or person in charge, including whether or not the occupier had or should have been granted an effective opportunity to make representations before the decision was made to terminate the right of residence.
(2) The right of residence of an occupier who is an employee and whose right of residence arises solely from an employment agreement, may be terminated if the occupier resigns from employment or is dismissed according with the provisions of the Labour Relations Act.

2.3. Promotion of Administrative Justice Act (No. 3 of 2000) [PAJA]

This Act intends to allow for administrative actions to be efficient and to allow for citizens to take responsibility for their behaviours. It is linked with Section 33 of the Constitution that reassures that administrative action will be understandable, legitimate to the legal environment and just. PAJA allows for the justness of the action to be verified, for queries or questions to be answered and for it to be seen by a court if necessary.

This law is valuable to the people and communities as it effectively means that communication during processes such as the EIA process allow for them to be informed in a manner that they comprehend, as well for matters to be communicated and reconciled.

2.4. Development Facilitation Act (No. 67 of 1995)

The Development of Facilitation Act serves the purpose of providing guiding values and procedures that can assist with the execution of projects that allow for the growth of a particular place. This is regarding the formation of a "Development and Planning Commission" as well as tribunals, which are mandated to allow for peaceful solutions to challenges encountered, as well as encourage the growth of both urban and rural settings.

2.5. National Environmental Management Act (No. 107 of 1998) [NEMA]

The function of the NEMA is to allow for collaborative ruling that focusses on the environment by means of the formulation of values and procedures that allow for the engagement with stakeholders on respective outcomes.

2.6. National Water Act (No. 36 of 1998)

This Act identifies water as a supply which is not always accessible throughout the country even though it is owned by all citizens of the land. It acknowledges that legislation in previous years has not allowed for access to all citizens but that the government in power is mandated to make it available to all of the people of the country. It acknowledges the need for principles of sustainability to govern the way in which water is consumed such that all people can receive its advantages. The requirement for water to be effectively controlled has been identified such that it can be available to all citizens in South Africa.
It is applicable as it is important to consider the social implications and context of a resource such as water in a particular country as it allows for the understanding of the rights of ownership and accessibility of it.

2.7. Scorecard for the Broad Based Socio-Economic Empowerment Charter for the South African Mining Industry (Notice 1639 of 2004)

The vision of the Scorecard for the Broad Based Socio-Economic Empowerment Charter for the South African Mining Industry (Mining Charter) is that all behaviours and promises made are aligned with a joint vision of an international industry which uses the reserves of people and finances of the people of South Africa and in return presents advantages to all South Africans.

The Mining Charter mentioned above introduces the concept of a scorecard, which serves the purpose of guiding the aims of companies that are in or intending to become involved in the mining environment in South Africa. This scorecard is a crucial part in the decision making of the Minister of Mineral Resources as whether to grant mining rights to a particular company.

The scorecard addresses the following core themes:

- Human Resources Development,
- Employment equity,
- Migrant labour,
- Mine community and rural development,
- Housing and living conditions,
- Procurement,
- Ownership and joint ventures,
- Beneficiation,
- Reporting.

It is a valuable law to consider for the mining environment in South Africa as it influences the way a mine would need to be operated and the social considerations that would need to be taken into account in all phases of the mining endeavor.

2.8. Mineral and Petroleum Resources Development Act 2002 (Act No. 28 of 2002) [MPRDA]

This Act serves the purpose of ensuring that companies who intend to mine in the South African environment evaluate and consider the effects of the project or development from a social viewpoint. This means that all components of the phases associated with mining would need to be investigated to anticipate impacts. It also requires the development of a Social and Labour Plan (SLP) to encourage growth of surrounding or impacted populations and to attempt to diminish or decrease the adverse effects.

3. BASELINE INFORMATION

The baseline information presented in this section is characteristically that which is relevant to the study area and therefore is that of the Lejweleputswa District Municipality (LDM) and Matjhabeng Local Municipality (MLM) respectively. It gives insight into core socio-economic baseline conditions of population, employment, access to sanitation, main housing types, education, waste removal and industries of the area in which the SIA has been conducted.

3.1. Vision of the Free State Province and Lejweleputswa District Municipality

The inherent vision for the broader context of Free State is that "by 2030, Free State shall have a resilient, thriving and competitive economy that is inclusive with immense prospects for human development anchored on the principles of unity, dignity, diversity, equality and prosperity for all". This is intended to be achieved by addressing the following subcategories within the province:

- Economic restructuring, growth and employment creation;
- Education, innovation and skills development;
- Improved quality of life;
- Sustainable rural development;
- Building social cohesion.[22]

This is ties in with the vision of the district municipality is to be "A leader in sustainable development and service delivery by 2030".[23]

3.2. Population of the LDM

The LDM indicated a decrease in its entirety of the population between 2001 and 2011, with the most prominent declines evident in local municipalities such as Nala, Tswelopele and Tokologo Local Municipalities. The MLM also indicated a decrease in the population. This is also represented in Figure 3 below. [24]

DEMOGRAPHICS		
Population	2001	2011
South Africa	44819777	51770561
Free State	2706771	2745590
DC18: Lejweleputswa	**657012**	**627626**
FS181: Masilonyana	64409	63334
FS182: Tokologo	32455	28986
FS183: Tswelopele	53714	47625
FS184: Matjhabeng	408170	406461
FS185: Nala	98264	81220

Figure 3: Population of the Free State and Local Municipalities from2001-2011.[25]

Figure 4 represents a comparison of the size of the Free State as a province and Lejweleputswa Local Municipality over the period of 1996-2011. It is apparent from the figure that there has been an

[22] Lejweleputswa Final IDP, 2016-2017.
[23] Lejweleputswa Final IDP, 2016-2017.
[24] Lejweleputswa Final IDP, 2016-2017.
[25] Lejweleputswa Final IDP, 2016-2017.

increase in the population of the Free State but a decrease in the LDM. A more recent representation of the local population of LDM in the broader context of the Free State constitutes 22,8% of its population.[26]

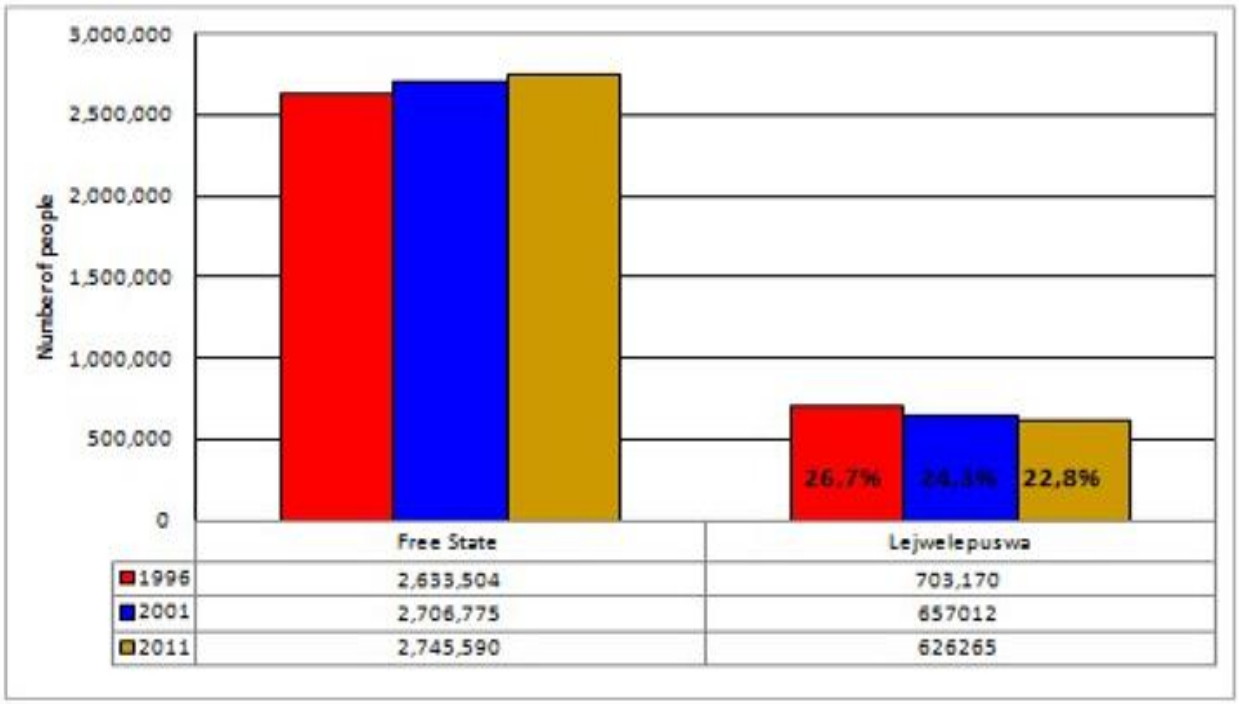
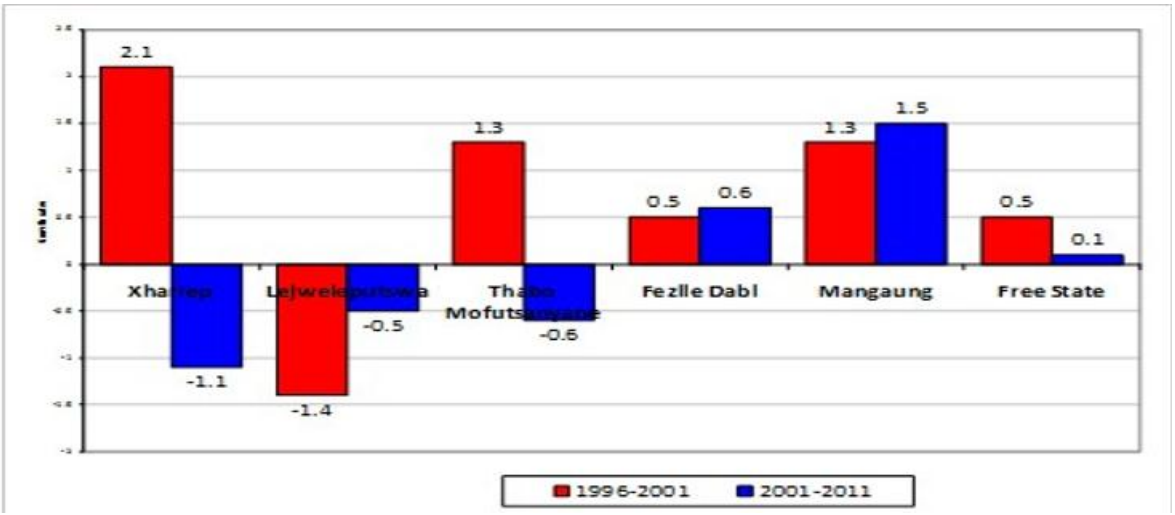


Figure 4 Population Sizes of Free State and LDM.[27]

3.3. Population growth rates of LDM

The growth (whether positive or negative) of the respective local municipalities is shown in Figure 5. Between both the periods of 1996-2001, and 2001-2011, Lejweleputswa Local Municipality has not shown positive growth, rather negative growth and has evidently been the most impacted. The core cause of this is anticipated to be movement of people to neighbouring districts. [28]



[26] Lejweleputswa Final IDP, 2016-2017.
[27] Lejweleputswa Final IDP, 2016-2017.
[28] Lejweleputswa Final IDP, 2016-2017.

Figure 5 Population growth rate of Free State by Municipalities.[29]

3.4. Population distribution of LDM

Figure 6 indicates population distribution by age and it can be seen that the majority of the population rests between the ages of 15-54.[30]

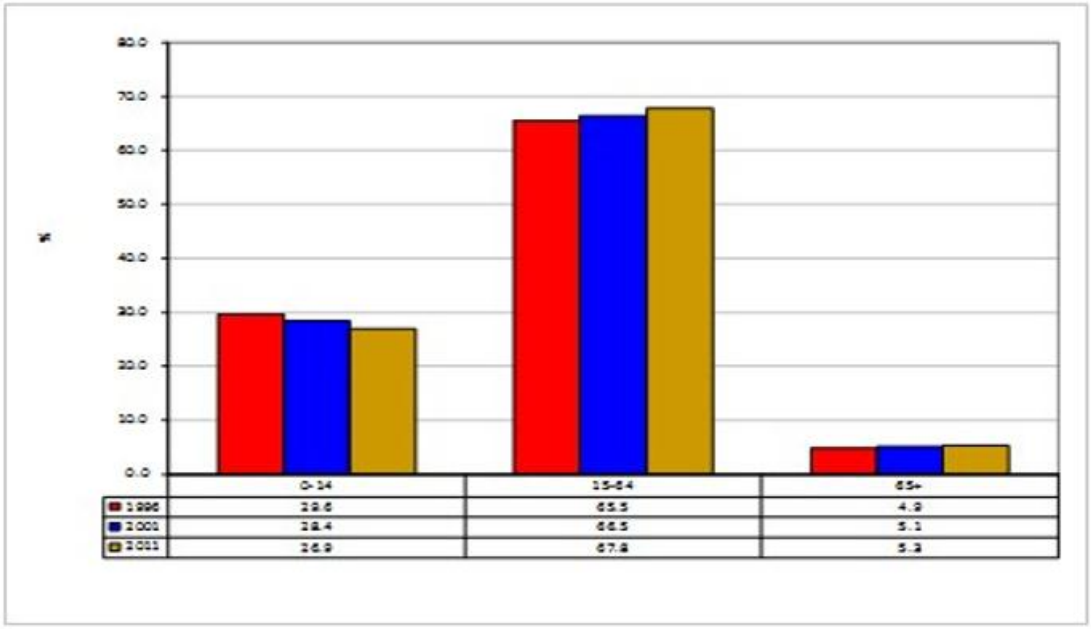


Figure 6 Population Distribution of LDM by age.[31]

3.5. Population distribution by population group of LDM

The largest representation of distribution of the population was Black African for the full period in review as indicated in Figure 7, followed by White and Coloured populations. [32]

[29] Lejweleputswa Final IDP, 2016-2017.
[30] Lejweleputswa Final IDP, 2016-2017.
[31] Lejweleputswa Final IDP, 2016-2017.
[32] Lejweleputswa Final IDP, 2016-2017.

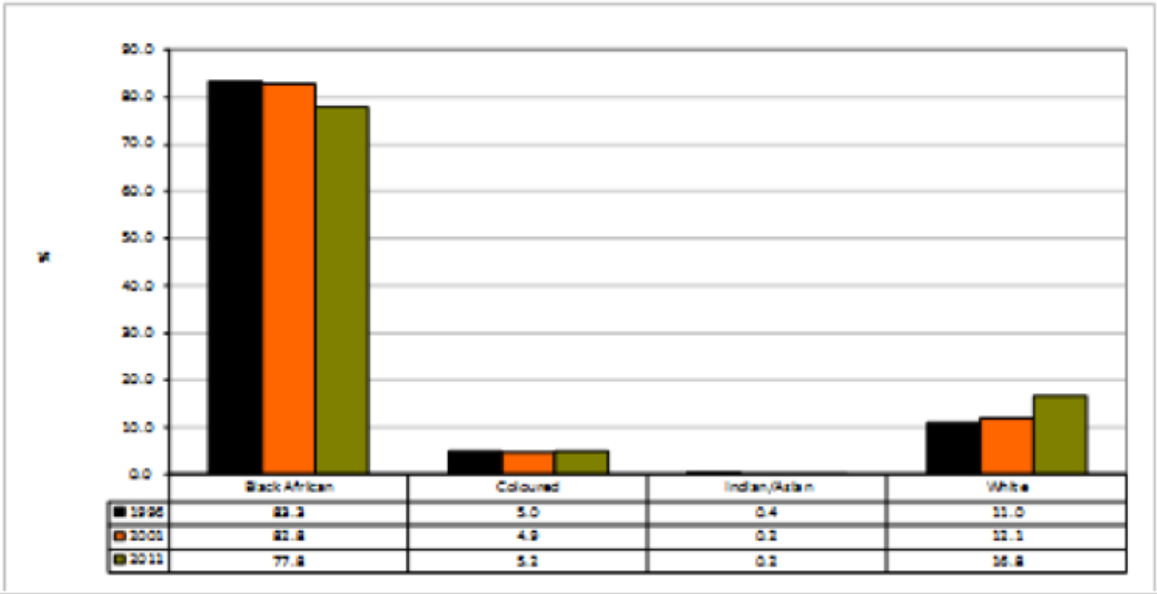


Figure 7 Percentage distribution of LDM population by population group.[33]

3.6. Population using energy for lighting, cooking and heating of LDM

Figure 8 shows that there has been an increase in the use of electricity for the purpose of lighting and cooking. This is attributed to a greater availability of electricity as a whole.[34]

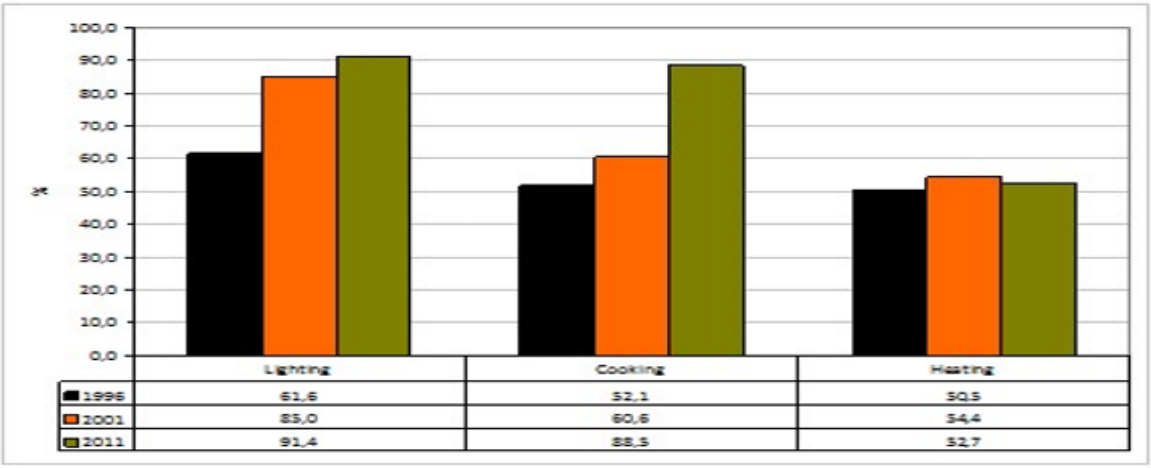
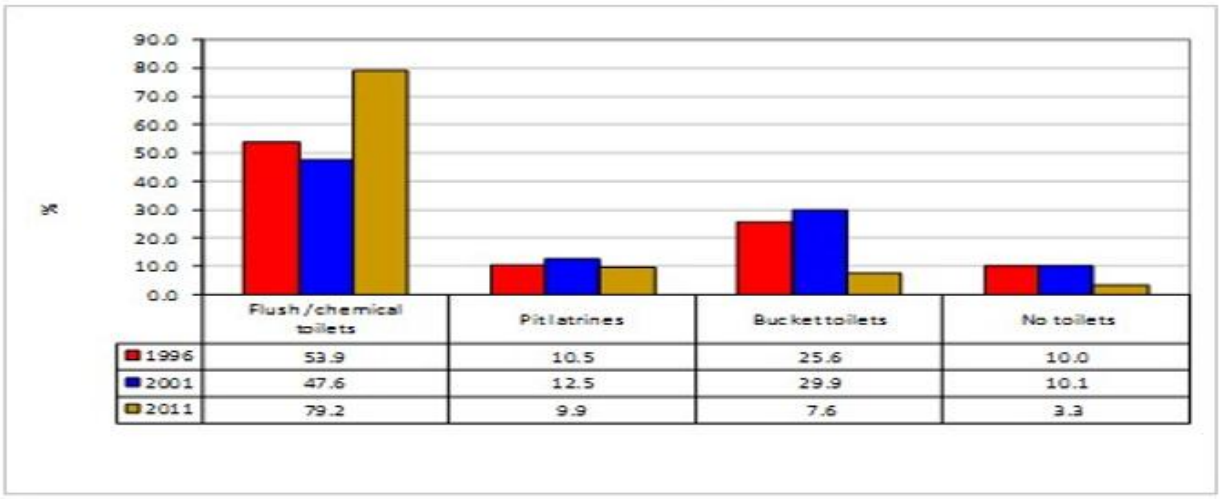


Figure 8 Percentage distribution of housing in the LDM using electricity for lights, cooking and heating.[35]

3.7. Accessibility to sanitation of the LDM

It is clear in Figure 9 that there has been a rise in the use of flush/chemical toilets between the years 2001-2011, from 47.6% to 79.2%, and the reduction in use of pit latrines and bucket toilets.[36]

[33] Lejweleputswa Final IDP, 2016-2017.
[34] Lejweleputswa Final IDP, 2016-2017.
[35] Lejweleputswa Final IDP, 2016-2017.
[36] Lejweleputswa Final IDP, 2016-2017.

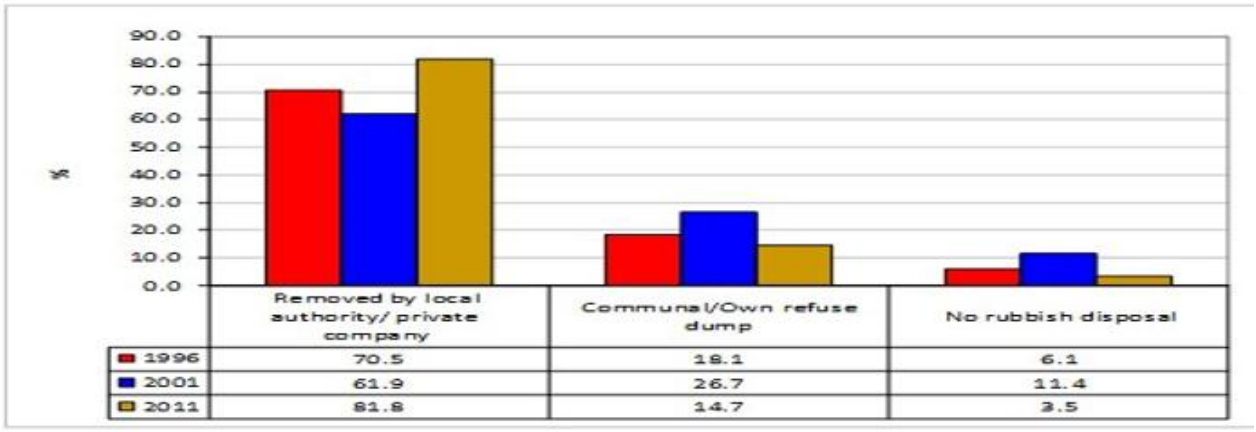


	Flush /chemical toilets	Pit latrines	Bucket toilets	No toilets
1996	53.9	10.5	25.6	10.0
2001	47.6	12.5	29.9	10.1
2011	79.2	9.9	7.6	3.3

Figure 9 Distribution percentage by type of Toilets in LDM.[37]

3.8. Refuse removal in the LDM

Figure 10 shows an increase in municipal waste collection and disposal. Communal / own disposal has decreased from 18.1% to 14.7% between the period of 1996-2011. [38]



	Removed by local authority/ private company	Communal/Own refuse dump	No rubbish disposal
1996	70.5	18.1	6.1
2001	61.9	26.7	11.4
2011	81.8	14.7	3.5

Figure 10 Distribution percentage by type refuse removal in the LDM.[39]

3.9. Access to education in the LDM

The access to education is indicated in Figure 10 where there is a drop in the number of citizens who have no schooling and therefore more people are attending school. There is a rise in the amount of people with a Matric (grade 12) education from the year 1996-2011.[40]

[37] Lejweleputswa Final IDP, 2016-2017.
[38] Lejweleputswa Final IDP, 2016-2017.
[39] Lejweleputswa Final IDP, 2016-2017.
[40] Lejweleputswa Final IDP, 2016-2017.

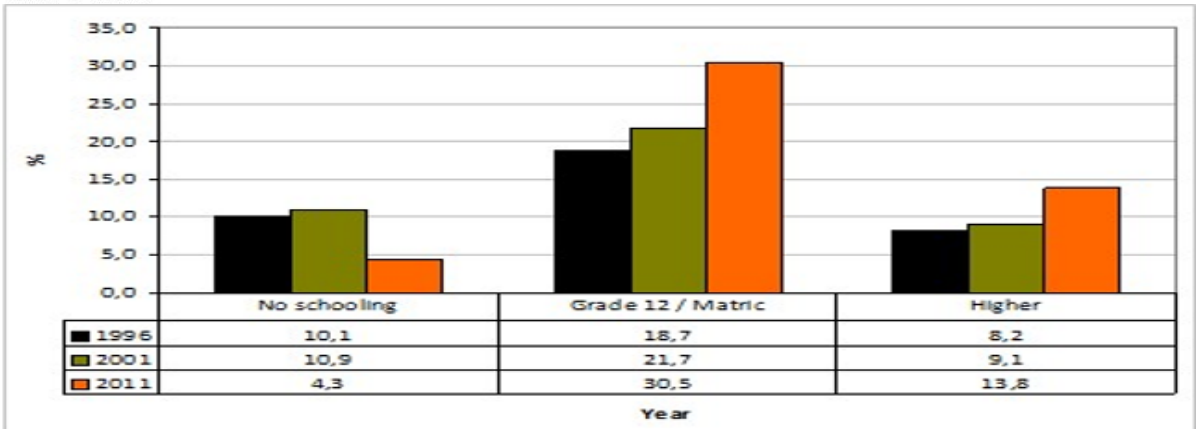


Figure 11Education distribution in the LDM.[41]

3.10. Unemployment in the LDM

LDM has the second highest unemployment rate of the District Municipalities within the province as represented in Figure 12. This could be attributed to the shutting down of numerous mining endeavours in vicinity. Areas of growth have been identified to be directed toward local economic development agencies.[42]

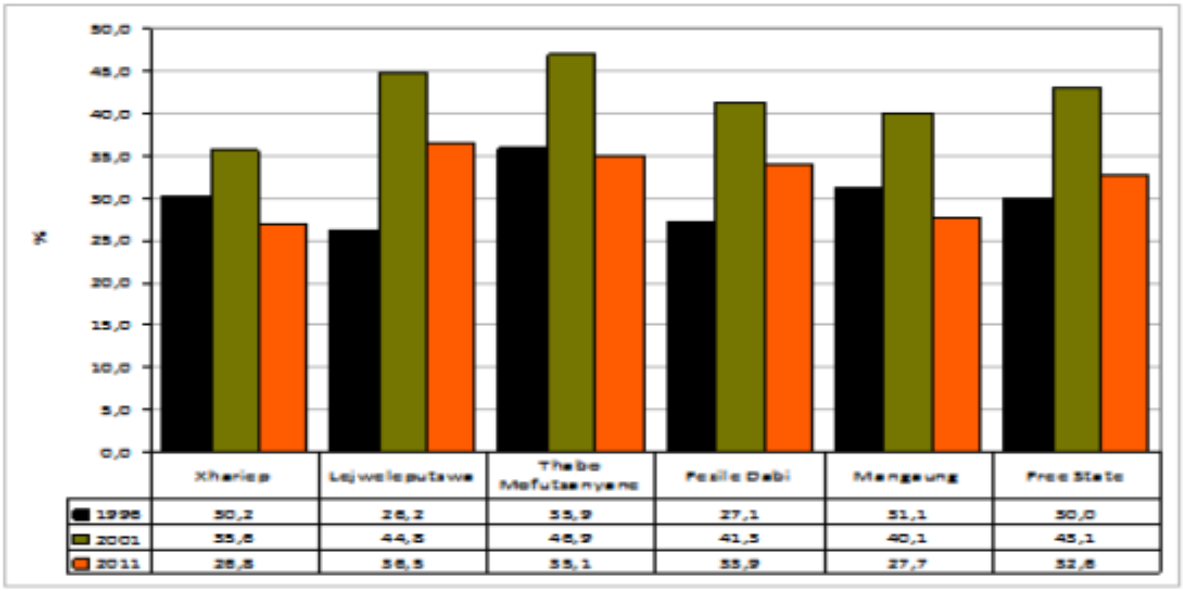
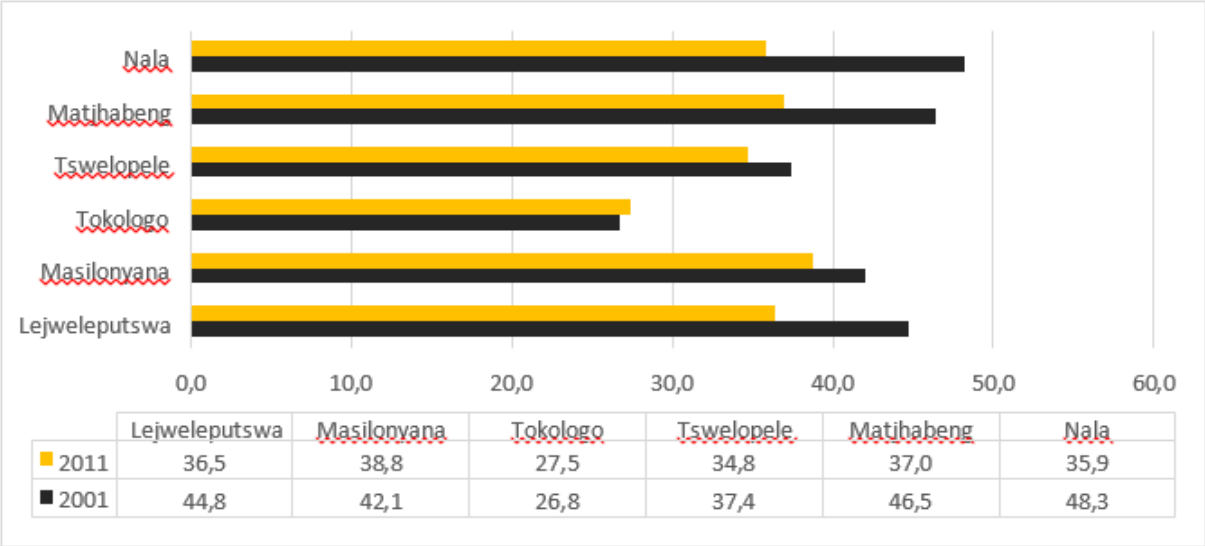


Figure 12 Unemployment status of Free State 1996-2011.[43]

3.11. Unemployment rate of youth in LDM

[41] Lejweleputswa Final IDP, 2016-2017.
[42] Lejweleputswa Final IDP, 2016-2017.
[43] Lejweleputswa Final IDP, 2016-2017.

Youth unemployment is indicated in Figure 13, where MLM has the highest unemployment rate for the youth in 2011 with 38.8%.

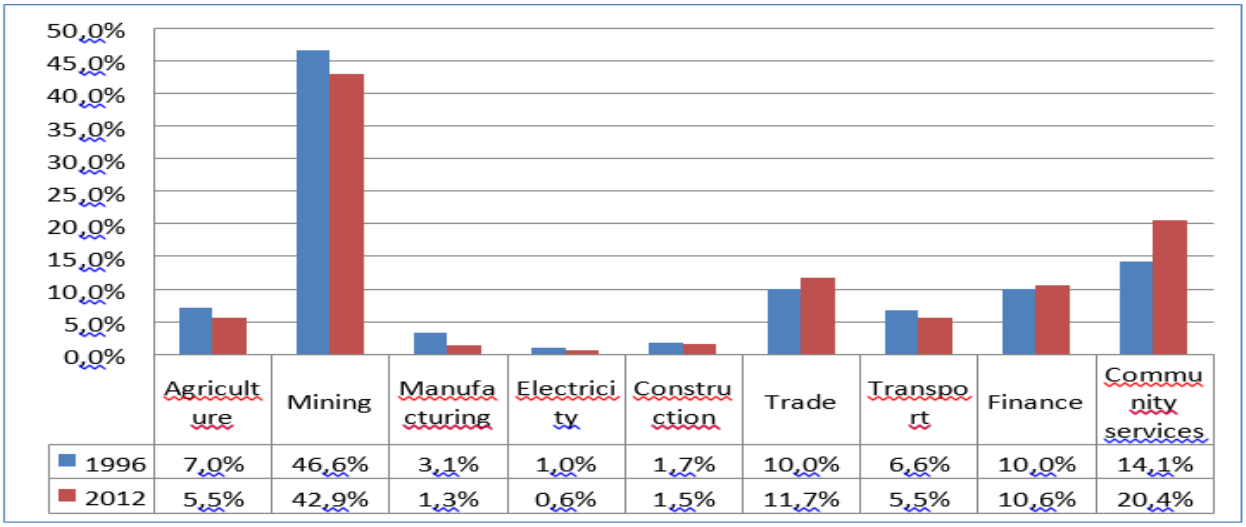


	Lejweleputswa	Masilonyana	Tokologo	Tswelopele	Matjhabeng	Nala
2011	36,5	38,8	27,5	34,8	37,0	35,9
2001	44,8	42,1	26,8	37,4	46,5	48,3

Figure 13 LDM youth unemployment rate.[44]

3.12. Core industries in the LDM

Industries present within the LDM are agriculture, mining, manufacturing, electricity, construction, trade, transport, finance and community services respectively. Figure 14 shows a decline in all the industries that play a role in the GDP apart from trading and finance sectors, between the years 1996-2012. [45]



	Agriculture	Mining	Manufacturing	Electricity	Construction	Trade	Transport	Finance	Community services
1996	7,0%	46,6%	3,1%	1,0%	1,7%	10,0%	6,6%	10,0%	14,1%
2012	5,5%	42,9%	1,3%	0,6%	1,5%	11,7%	5,5%	10,6%	20,4%

Figure 14 GDP Contribution.[46]

[44] Lejweleputswa Final IDP, 2016-2017.
[45] Lejweleputswa Final IDP, 2016-2017.
[46] Lejweleputswa Final IDP, 2016-2017.

3.13. Summary of the conditions in the LDM

The following points are the main considerations that would need to be taken into account in this SIA:

- The population is decreasing and is considered to be due to migration or urbanization;
- The majority of the population comprises of Black African people;
- Access to sanitation is increasing;
- The service of waste removal is decreasing;
- There is a rise of education levels which means more of the population is accessing education;
- An estimated 37% of the youth are unemployed;
- An economic view of the LDM shows that the major industries are declining and trade seems to be the only resilient sector currently.

Collaboratively these figures point to a local economy that is in need of a stimulus for economic growth which can bolster the improvement in the LDM.

3.14. Matjhabeng Local Municipality (MLM) Municipal Profile

3.14.1. Unemployment of MLM

Unemployment in the MLM is suggested to be 27.7%. [47]

3.14.2. Size of the MLM

The size of the MLM is estimated at 516 103 hectares. Farming uses 34. 91% of the area and mining a mere 1.5% of the local municipality. An approximate 60% of the land in the MLM is not currently in use for commercial purposes.[48]

3.14.3. Manner in which population is located in the MLM

MLM has an estimated population of 406 461. The large majority of the population lives in the city areas (97.7%) and 2.26% of the population lives in the rural areas. . [49]

3.14.4. Household income of the MLM

An estimated 16.09% of the population does not earn and income in the MLM. There has been an increase in the people attaining an income of between R3500 and R12 800 per month despite the above figure.[50]

[47] Lejweleputswa Final IDP, 2016-2017.
[48] Matjhabeng Local Municipality Municipal Profile by HDA, 2014.
[49] Matjhabeng Local Municipality Municipal Profile by HDA, 2014.
[50] Matjhabeng Local Municipality Municipal Profile by HDA, 2014.

3.13.4. Education level in the MLM

A larger number of students in the MLM appear to achieve a Grade 10 education. A small portion of the population continue their education to Grade 12 but the majority of the education is at a Primary School Level and up until Grade 9.[51]

3.13.5. Housing in the MLM

The main form of housing type in the MLM is that of a house, which is represented by 89 561 people who have houses within the local municipality. 16 179 homes that are considered to be of an informal settlement type of dwelling. Approximately 8121 backyard shacks are located in the MLM.[52]

3.13.6. Access to piped water in the MLM

Per figures of 2011, much of the population in the MLM had access to piped water, which is estimated at over 100 000 households. This was either inside the yard or the dwelling. A small percentage of the population did not have access to piped water or had access to water in the surrounds.[53]

3.13.7. Sanitation in the MLM

The main form of sanitation used is that of chemical toilets which are available to approximately 100 000 households. A small portion of under 10 000 households have either no sanitation, basic sanitation or the use of a bucket toilet. [54]

3.13.8. Lighting in the MLM

Gas is dominantly used as a means of lighting in the MLM with over 100 000 households using it, and a very small portion of the population using electricity, candles and solar to provide lighting.[55]

3.13.9. Economic sectors in the MLM

The MLM has numerous sectors that form a part it (refer to Figure 15) below. The sectors that are employing the highest numbers of people are retail, community and social, mining and the general government. Mining adds value of greater than 40.51% of the GVA of the municipality and provides employment for 13.36% of the population.[56]

[51] Matjhabeng Local Municipality Municipal Profile by HDA, 2014.
[52] Matjhabeng Local Municipality Municipal Profile by HDA, 2014.
[53] Matjhabeng Local Municipality Municipal Profile by HDA, 2014.
[54] Matjhabeng Local Municipality Municipal Profile by HDA, 2014.
[55] Matjhabeng Local Municipality Municipal Profile by HDA, 2014.
[56] Matjhabeng Local Municipality Municipal Profile by HDA, 2014.

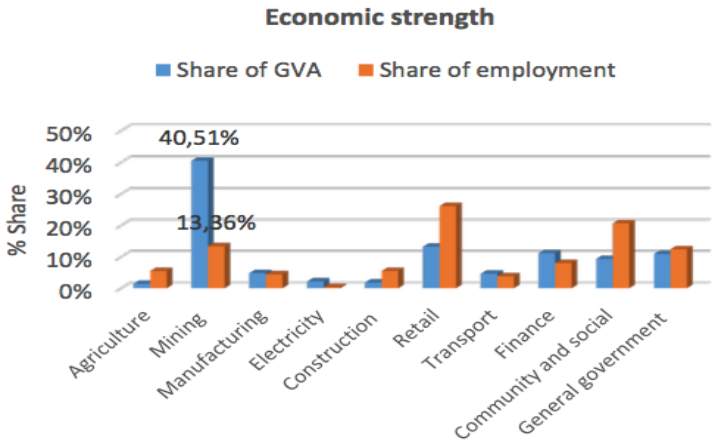


Figure 15: Economic sectors in the MLM.[57]

3.13.10. Spatial Development Network: accessibility analysis from active mines in the MLM

Figure 16 is one that illustrates the accessibility of the people in current and existing housing projects, to active mines in the MLM. This information provides an indication of how accessible a new mine in the area would be to other people in the MLM. This would be related to the anticipated influx of workers and the areas that the people may come from.

The image below indicates the locations of the other mines in the MLM as well as the respective time it takes to get to the active mines. This is represented by the different shades of blue and white that are indicated in the key of the map. It is valuable to take into consideration as it could be insightful as to where in the surrounds the influx of workers may come from.

[57] Matjhabeng Local Municipality Municipal Profile by HDA, 2014.

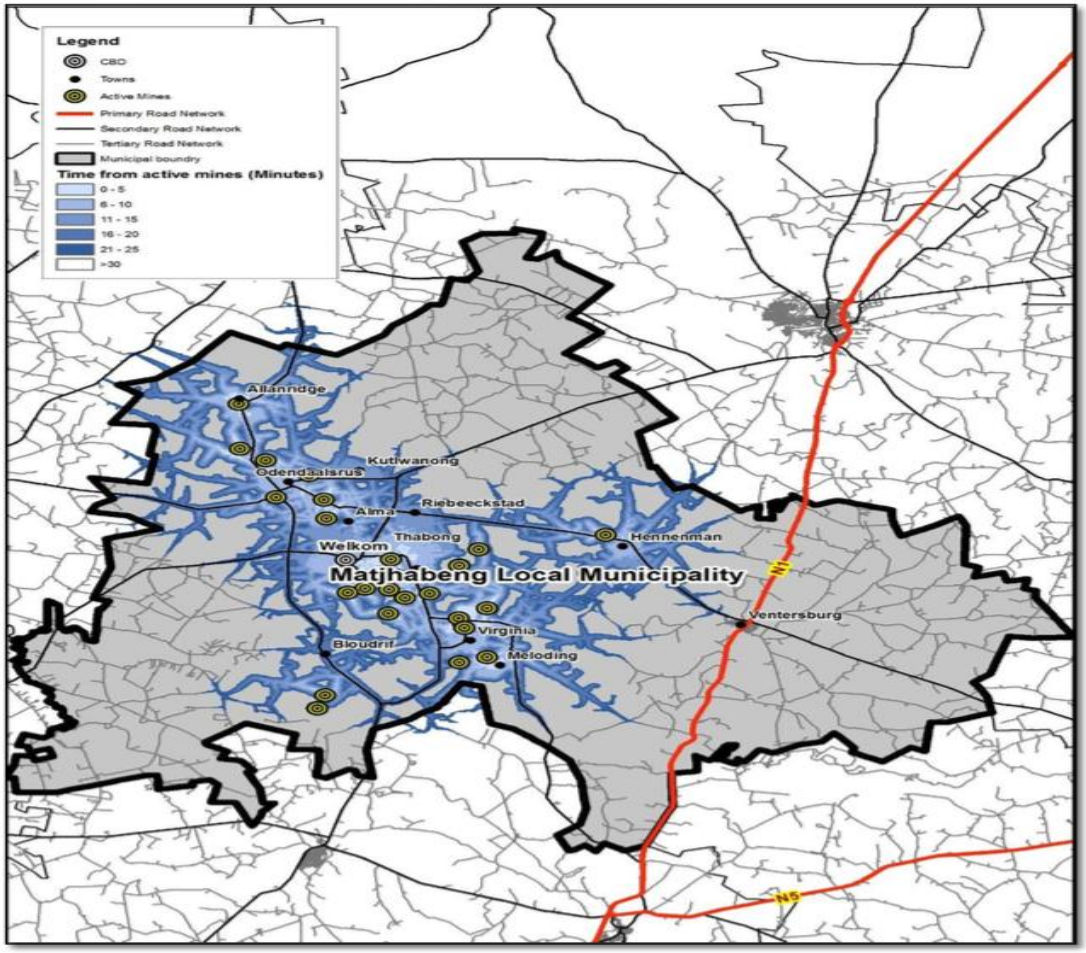


Figure 16: Accessibility to mines from housing projects in vicinity.[58]

3.13.11. Summary of the MLM baseline

The following points are the main considerations that would need to be taken into account for the SEIA:

- Unemployment is currently considered to be at 27.7%;
- The spread of the population is dominantly within urban areas;
- The majority of the population have a Primary School education;
- Main dwelling types are brick houses or informal homes;
- The large majority of the population have access to sanitation facilities and piped water;
- Gas is dominantly used for lighting purposes;
- Mining is a large contributor to the local economy and employment in the MLM;
- The greatest percentage of land is used by farming activities.

[58] Matjhabeng Local Municipality Municipal Profile by HDA, 2014.

4. SOCIO-ECONOMIC ENVIRONMENT

The socio-economic environment that would be impacted by the project can also be described as the social area of influence. It can be identified on three main levels: the first level is the footprint, the second level is the local level and third level, the regional level.
The area of the site and footprint characteristically includes the affected localities that surround the project site, where the local level refers to the particular wards that are relevant and regional is linked to the regional municipality. This means that the site area effectively refers to the project site and the directly affected farmers, the ward that is dominantly relevant is Ward 3 and the municipality is the Majhabeng Local Municipality.

This section that follows will address the origins of these areas and describe them in their current states. It will also provide an identification of the stakeholders in these respective areas primarily at the site level of the project. The local people and communities are considered stakeholders.

4.1. Stakeholder identification

The identification of stakeholders that feature in the figure that follows, are stakeholders as defined in the introduction of this report. This means that they are stakeholders for the collection of data for the SEIA and are not limited to only these people and communities in other process involved in the Environmental Impact Assessment Process.
Figure 17 below is one that illustrates the identification of the broader stakeholder communities that feature within the social area of influence and is described in more detail in Figure 17.

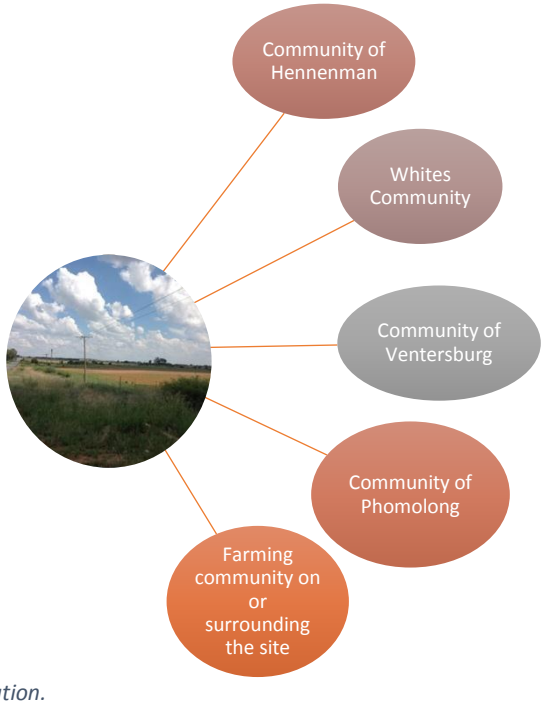


Figure 17: Stakeholder identification.

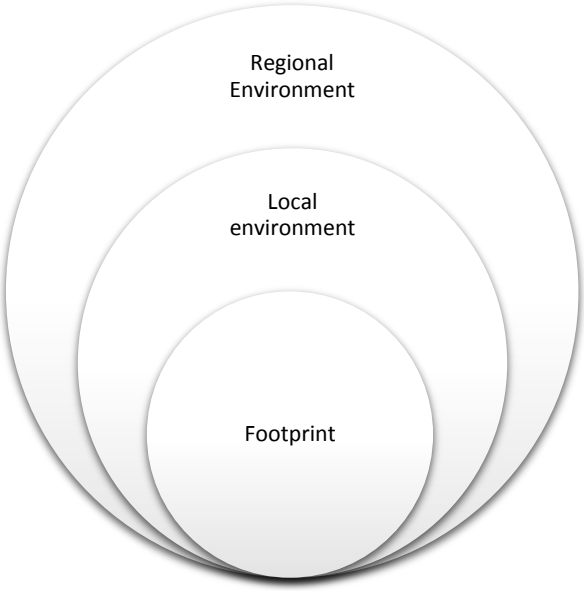


Figure 18: Breakdown of the Social Area of Influence.

The footprint indicated in Figure 18 above, would include the area and respective social elements that are directly affected. This would have reference to the farmer Mr. Vogel and the farmworkers that reside on his property. This is the area where the most intensive impacts would be experienced. The local environment would include the surrounding environment. This is surrounding farmers, Phomolong, Hennenman, Whites Community and Ventersburg. These areas are anticipated to experience impacts but not on the level that the locality of the footprint would. The regional environment would be the larger context of the area surrounding Hennenman and Ventersburg and Wards 2,3.

4.2. The Social Area of Influence

4.2.1. Hennenman

Hennenman is a town that is mostly currently developed around the farming sector and not around mining as is the case in many town in the MLM. Hennenman originated as a railway stop. Prior 1927 it was known as Ventersburg road. Soon after that there was a name change to "Hennenman" to acknowledge the local farmer P.F. Hennenman.

Whilst the Apartheid system was present in South Africa and close to the 1944 timeframe, the black people of the community lived in a separate living space in the southern parts of the town. This however was temporary as the leadership of South Africa demanded that area be unoccupied and resulted in the formation of the township of "Vergenoeg," which is today known as Phomolong.[59]

The main language currently spoken in Hennenman is Afrikaans and the estimated current population is 3793 people.[60] The average size of a family is 2,5 and is still mainly male-headed. An

[59] Wikipedia, 2017.
[60] Free State info, 2017.

estimated 99% of the population has access to sanitation. Services to the area are considered good with efficient refuse removal, access to water within the homes, and electricity.[61]
Limestone was discovered in the area and was the impetus of the origins of the two cement factories in the town. [62]

4.2.2. Whites Community

Whites Community (locally known as "Whites") is a settlement located outside of Hennenman. Whites, as with Hennenman, also developed from the main railway stop of the area.[63]

According to interviews there are less than 350 people that live in the Whites and in terms of health, HIV/AIDS is a major challenge. There are no health facilities and community members are reliant on infrastructure in the surrounding towns and Phomolong Township. With the deteriorating houses and number of people who live in the area, sanitation poses as another challenge in the community.

Whites has a Primary School, a Golf Club and a Bowling Green. The local school has shipping containers that have been converted into classrooms for Primary School Students.

Figure 19: Whites community outside of Hennenman

[61] Stats SA, Accessed 2017.
[62] Showme.co.za website, 2017.
[63] Wikipedia, 2017.

Figure 20: Settlements in Whites community outside of Hennenman

Figure 21: Whites Golf Club in Whites Community

Figure 22: School in the Whites Community.

4.2.3. Ventersburg

Ventersburg is positioned along the main N1 highway in the Free State Province and is an estimated 150km from Bloemfontein.

Ventersburg has its origins from the agricultural land of Kromfontein on which it was built, which was owned PA Venter prior to the mid-1800s. Descendants of PA Venter enabled to establishment of the Dutch Reformed Church in the 1860s and it was acknowledged as a town in 1873.[64]

The population of Ventersburg per the census of 2011 was estimated at 1297 people that reside in the town, made up of 368 households. It is dominantly an Afrikaans speaking town and dominantly represented by White (54,51%) and Black African (40,32%) populations. [65]

According to interviews currently and there are few young people (youth) who live in the town. It is a town that is perceived to be a safe one despite some of the social challenges such as low levels of prostitution and substance abuse, which are considered to be encouraged by the bus depot in the town.

Some of the sites and resources that are being considered to be of use for tourism in the town currently and for the future are the Skanskral Battlefield Memorial, location of the Sand River Convention, Iron Age Archaeological Site and San paintings, the Police Memorial and The Annual Mielie Pap Fees.

4.2.4. Phomolong

Population of Phomolong

Phomolong developed from the township of "Vergenoeg", which was located outside of Hennenman. It was common practice during the Apartheid regime to separate communities by race and culture.[66] Phomolong was estimated to have a population of 20 000 people in 2011 according to the census which was conducted in the area and is predominantly a Sesotho speaking community.[67]

Housing

Phomolong has formal housing and an informal housing extension to the south and west of Phomolong. Living conditions in these two parts of Phomolong are very different.

The formal section of Phomolong appears to have access to electricity and running water (via yard taps). The town has been designed in a grid style. Most of the toilets are present outside of the homes and are sometimes shared between households.
The informal extension of Phomolong has streetlights providing general lighting to the area in the evenings but not to each individual household. Men and women were observed carrying firewood,

[64] Wikipedia, 2017.
[65] Census, 2011.
[66] Wikipedia, 2017.
[67] City Population website, 2017.

which is probably the main energy source for cooking, heating and lighting. There does not seem to be a supply of water to this area or an arrangement of sanitation.

Figure 23: Indication of housing and main access to water supply, Phomolong

Figure 24: Women carrying firewood in the informal settlement outside Phomolong

Figure 25: Informal housing outside Phomolong

Facilities

In terms of facilities there is a local stadium, a clinic, schools, local churches and a few entrepreneurial ventures occurring such as car washes, grocery stores and hairdressers.

Many of the local shops and entrepreneurial ventures that are undertaken in the community are owned by people from foreign countries originally. It was expressed in an interview that a lot of the shop owners have good relations with the local people of Phomolong and allow them to access food and pay at the end of the month. This assists the people when there is a shortage of food or money during the month so that the respective people don't go hungry. This indicates a generally good standing relationship between people of the community and foreign citizens.

Figure 26: Business in Phomolong.

Figure 27: High School in Phomolong.

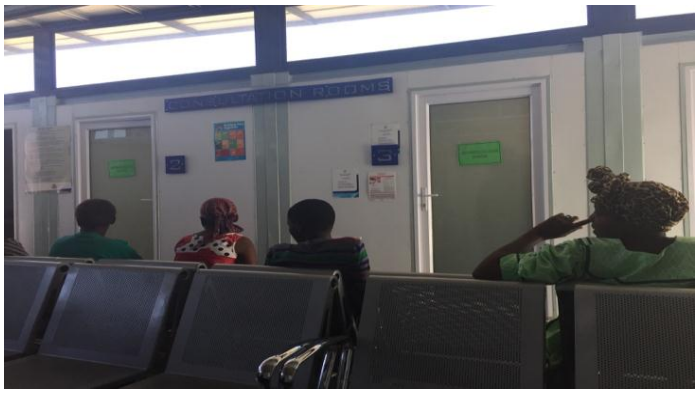


Figure 28: Clinic in Phomolong.

Waste management

Phomolong generally appeared to be free from litter within the community, however litter on the outskirts were prevalent.

Perception of safety

Through interviews the perception of the community is that it is a safe community but does have its elements of crime from time to time.

Education

Accessibility to education seems to be relatively good in the area with 4 Primary Schools and two High Schools.

Social challenges in the community

Some of the social challenges have been identified include:

- Alcoholism;
- Reliant on grants for income;
- “Gangsterism”;
- Hunger;
- Health issues such as HIV/AIDS and Tuberculosis;
- Teenage pregnancies.

Hunger seems to be a predominant concern in the community amongst both the adults and the children. It is perceived to be a large consideration for theft as well as absenteeism from school. It is currently being combated in some of the schools by providing one mean a day to the children at lunch time. In most cases these feeding schemes are funded by the State.

4.2.5. Farming community outside Hennenman and Ventersburg

The proposed surface infrastructure of the project will be located on properties owned by Mr. Vogel. The image following gives an indication of some of the infrastructure of the farm and a part of what is considered the heritage of the farm.

Figure 29: Component of Mr. Vogel's Farm.

Mr. Vogel's farm is one that is used for commercial generation in the domains of agriculture and as well livestock farming. The farming enterprise has expanded since 2013 with the lease of additional surrounding farmland. There are 22 permanent employees who assist with the farming and this may increase depending on the respective season, between 20-150 additional staff could be hired to assist with the harvesting. Eight permanent staff residents on the property (some with families) reside on the property temporarily, as an employment benefit. These homes are indicated in the image below.

Figure 30: Staff member's homes on Mr. Vogel's property.

The farm provides a livelihood to the farm owner and his family, but also has heritage significance for the family. Mr. Vogel is the fifth-generation member to be farming on this farm.

5. SOCIO-ECONOMIC IMPACT ASSESSMENT

The following section serves the purpose of the assessment of the impacts identified, as well as the mitigation and management recommendations of each impact. All the impacts identified and analyzed are categorized according to the phase of the project in which they occur, as well as the following themes. The 5 phases of the projects are pre-construction, construction of mine, operation of mine, decommissioning and post-closure. The themes of impacts that will be explored in these phases are quality of life impacts, health impacts, community impacts, cultural and land-use impacts respectively.

For integration and clarity purposes, the studies generated for the EIA addressing air quality, blasting, traffic, groundwater, surface water, visual aesthetics, Tailings Storage Facility (TSF) stability, soil and land capability, and radiation were used to investigate what the social implications of these factors would mean to the stakeholders in the social environment.

This section is structured in such a way that **two scenarios** are considered that allow for the wide identification of impacts and that which is associated with each scenario. This will allow for an understanding of the effects of the different decisions that would be facing the leaders of the proposed Ventersburg Project and respective stakeholders.

The scenarios that are going to be explored are:

i Mr. Vogel and farmworkers remain in their current dwellings;
ii Mr. Vogel farmworkers vacate their current dwellings (physical displacement).

These two scenarios would be referred to in each of the respective themes and phases that would be associated with the project.

There are the following stakeholders that appear surrounding the footprint surrounding the mine site that need to be taken into core consideration regarding the other specialist study results. They were chosen based on the fact that they are the nearest occupied areas to the mine. These stakeholders are:

- Mr. Vogel;
- Farmworkers on Mr. Vogel's farm;
- Mr. Coetzer;
- Phomolong community.

The purpose of addressing the impacts on the respective stakeholders in accordance with the themes are to identify the extent to which numerous impacts would be applicable to the stakeholder in question in the specific phases. It is to give as clear a picture as possible of the anticipated impacts of the proposed mine as well as addresses the full array of impacts that the stakeholder would experience.

The image below indicates the position of these stakeholders in comparison to the intended mine infrastructure.

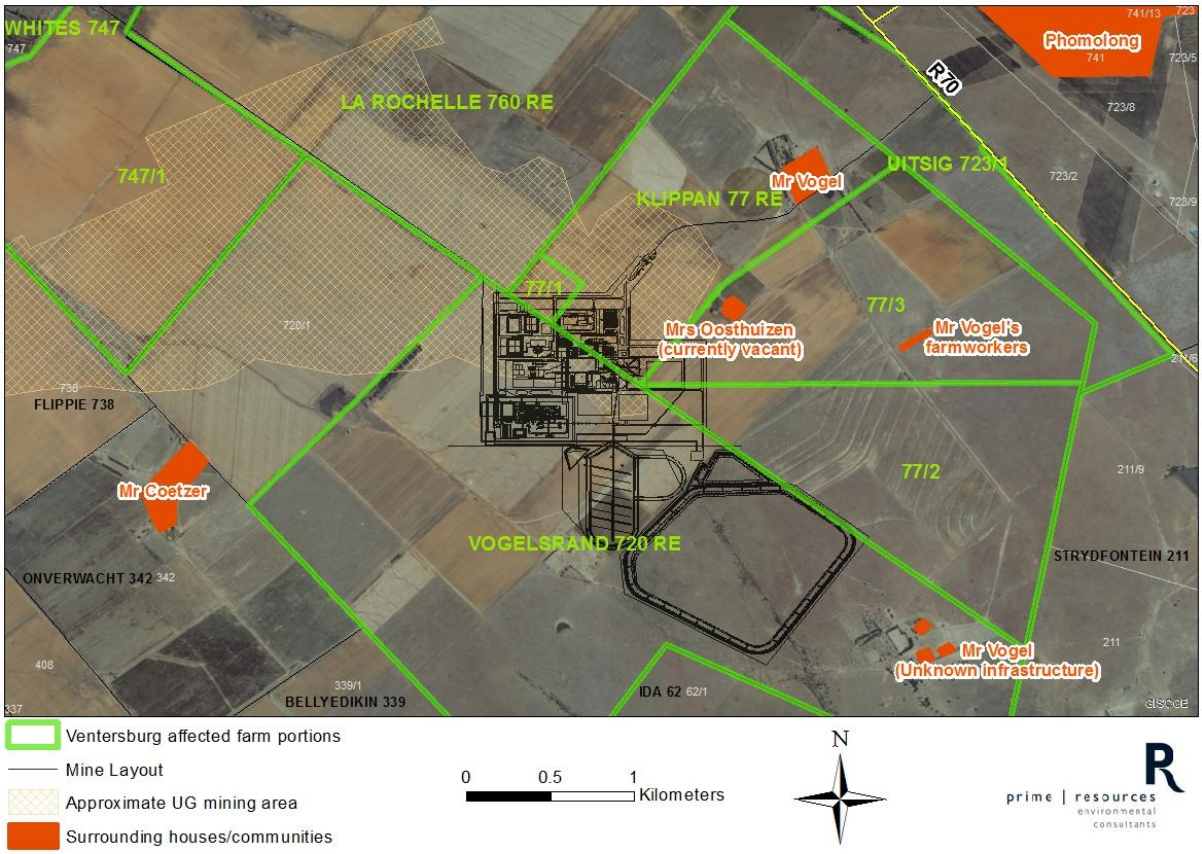


Figure 31: Stakeholders and intended mine infrastructure positioning

5.1. Pre-Construction Phase Impacts

The planning phase of the Ventersburg Mine is mostly complete. However, there are certain activities that would still need to take place and the purpose of this section is to feature these activities in the Pre-Construction Phase, where the impacts can be identified and quantified.

5.1.1. Pre-Construction Phase Positive Impacts

None foreseen.

5.1.2. Pre-Construction Phase Negative Impacts

General Community Impacts

Raising of expectations of people in surrounding communities and towns

It was evident in the interviews conducted with numerous stakeholders in Phomolong, Hennenman and Ventersburg that the possibility of a mine in the area raises the expectations of the way the mine can benefit the people of the surrounding area. The opening of a mine is also often anticipated that significant growth would happen in the vicinity that the mine operates in. This may occur as an indirect impact.

Receptor/ Resource	Process/ Activity	Social Impact	Impact effect	Magnitude (M)	Duration (D)	Scale(S)	Probability (P)	Significance	
								Rating	Value
Social area of influence (Phomolong, Hennenman, Ventersburg, Whites)	Opening of a mine	Raising of expectations of people in surrounding communities and towns	Need for communication for all stakeholders to have realistic expectations	8 [6]	3 [2]	3 [3]	4 [3]	56 [33]	Medium [Medium]

Mitigation and Management Measures:

- Clear expectations should be created regarding the employment opportunities that are available.
- A clear message should be communicated that development would only commence in 2021 and not before.

Devaluing of properties surrounding the intended mine

The majority of the land that surrounds the mine are farms which would decrease in value with a mine opening in the vicinity.

Receptor/ Resource	Process/ Activity	Social Impact	Impact effect	Magnitude (M)	Duration (D)	Scale(S)	Probability (P)	Significance	
								Rating	Value
Social area of influence (surrounding farmers)	Possibility of opening of a mine	Devaluing of properties surrounding the mine	Farmers losing value on an asset	6 [6]	3 [3]	2 [2]	3 [3]	33 [33]	Medium [Medium]

Mitigation and Management Measures:

- Cannot be mitigated

In-migration of people seeking employment

In-migration refers to the people from surrounding areas or other parts of the country who may flock to the Hennenman and Ventersburg region in search of employment opportunities. It is an impact often associated with the opening of new mines in the African environment. Impacts associated with this are: addition of pressure to the existing receiving environment (such as Phomolong) and possible conflict with surrounding community members over jobs. On a practical level, it can increase the extension of Phomolong with a growth in the number of people who reside in it.

Receptor/ Resource	Process/ Activity	Social Impact	Impact effect	Magnitude (M)	Duration (D)	Scale(S)	Probability (P)	Significance	
								Rating	Value
Social area of influence	Planning of	In-migration of people	Pressure on infrastructure,	10 [10]	3 [3]	3 [3]	4 [4]	64 [64]	High [High]

(Phomolong, Hennenman, Ventersburg).	opening the mine	seeking employment	possible conflict between residents and inflow of people.						

Mitigation and Management Measures:

This impact is very difficult to mitigate and manage but the following would assist:

- A social audit and census should be carried out where data regarding the residents, population numbers and challenges in Phomolong Informal Extension is collected. This could be initiated by the MLM as a means to draw a baseline of information to which data can be compared to over time;
- Discussions with the municipality to manage the in-migration would be needed. This could be assisted by the improvement of services to the informal extension as well as the constant monitoring of the law enforcement that people settling on private land without permission would be considered as unlawful.
- There would need to be the removal of people who settle unlawfully on private land.
- Discussions with the members of the Sustainable Growth Committee in principles related to the management of this impact where the local knowledge of the area of the members would play a critical role.

Impact Monitoring	
Monitoring	Time Frame for Monitoring
- The sustainable growth steering committee should be a platform of discussion regarding the issues that may arise from the area. - The role of the MLM in the management of Phomolong Informal Extension should be defined and clarified.	LOM LOM

Uncertainty among farmers

The following farmers were interviewed- Mr. Vogel, Mr. Coetzer and Mr. Theron, where they are considered to be directly affected. They all displayed similar concerns relating to the uncertainty for their long-term planning for farming.

Receptor/ Resource	**Process/ Activity**	**Social Impact**	**Impact effect**	**Magnitude (M)**	**Duration (D)**	**Scale(S)**	**Probability (P)**	**Significance**

								Rating	Value
Farmers directly affected in the social area of influence	Prospecting activities on farming land	Uncertainty among surrounding farmers	Creation of uncertainty	6 [4]	2 [2]	2 [2]	4 [3]	Medium [Low]	40 [24]

Mitigation and Management Measures:

- An agreed upon timeframe for communication regarding the establishment of the mine.
- Establishment of a grievance mechanism which can allow for a channel of communication where issues can be addressed effectively.

Possible economic and/or physical displacement of directly affected farmer

The farmer who would be affected in terms of both economic and physical displacement is Mr. Vogel and would be relevant in this phase if scenario (ii) is considered as the best scenario for all parties involved.

Receptor/ Resource	**Process/ Activity**	**Social Impact**	**Impact effect**	**Magnitude (M)**	**Duration (D)**	**Scale(S)**	**Probability (P)**	**Significance**	
								Rating	Value
Social area of influence (Farmer: Mr. Vogel property)	Preparation for construction phase	Economic and physical displacement of farmer, Mr. Vogel.	Negative	10 [6]	5 [5]	2 [2]	4 [3]	High [Medium]	68 [39]

Mitigation and Management Measures:

- An agreement between all parties should be drawn up for the fair compensation for the land.
- Fair compensation for the physical and economic displacement of Mr. Vogel.
- The management of this impact would be related to the Stakeholder Engagement Plan which would be needed before any process involving the opening of the mine takes place.

5.2. Construction Phase Impacts

The way in which this section is structured is important to take into account: there the section that addresses the **scenarios** as previously indicated (i.e. (i): Mr. Vogel and Farmworkers remain in current dwellings; (ii): Mr. Vogel and farmworkers vacate the dwellings and property) as well as the respective theme that is being addressed (i.e. quality of life impact), and then there are **general**

impacts which are classified as such, all for the **construction** phase. This provides a clear indication of the impacts that would be anticipated for each scenario.

5.2.1. Positive Construction Phase Impacts

None foreseen.

5.2.2. Negative Construction Phase Impacts

5.2.2.1. Impacts that address scenario (i): Mr. Vogel and Farmworkers remain in current dwellings

The outcomes of other specialist reports that are needed for considering in the quantifying of the social impacts are as follows:

- The state of **air quality** has a **low** significance rating with mitigation according to *Specialist Report A*;

- The *Specialist Report B* on blasting addresses the implications on ground vibration, air-blasting, fly-rock and dust and smoke and core parts of the predictions are as follows:
  - With the mitigation measures implemented, there should not be damage to buildings in their respective positions as a result of **ground vibrations** and therefore has a **low** significance rating;
  - **Ground vibration** can **affect livestock** in making them fearful so it is a part of the mitigation measures that they are moved at least 500m away from the blasting area;
  - With mitigation, the significance of **air blasting** is considered to have a **low** significance rating although rattling doors and windows may still occur and startling of livestock;
  - With mitigation, **fly-rock** has a **low** significance rating;
  - With mitigation, **dust and smoke** has a **medium** significance rating;

- *Specialist Report C* on **traffic** suggests a **low** significance rating with mitigation;

- *Specialist Report D* on **visual aesthetics** suggests a **medium** significance rating with mitigation;

- *Specialist Report E* on **soil and land capability** suggests a **medium** significance rating with mitigation. It is important to consider that soil and wind erosion is expected. The Tailings Storage Facility (TSF) area, Waste Rock Dump (WRD) area and shaft area is also an area where its location will not be able to be used for agriculture or livestock farming.

- *Specialist Report F* on **noise** suggests a **low** significance rating with mitigation as it is not foreseen that the noise expected in the daytime would be higher than the South African National Standards (SANS) limits for rural or urban environments.

Quality of Life Impacts

Reduced quality of life

The respective components that would need to be considered in the quality of life of the stakeholders outside of the footprint area and in this circumstance, that of Mr. Vogel and the farmworkers who work for him, are: air quality, blasting, noise, traffic, soil and land capability, and visual aesthetics. Each of these components had specific reports that addressed them and it is assumed that the mitigation measures of these reports would be implemented and therefore the measurement of the social impact is with these mitigation measures in place.

It is important to consider that these factors combined influence the quality of life of the residents surrounding the footprint and although none of the ratings in isolation are high, cumulatively they have a high effect on Mr. Vogel and the farmworkers given the comparison to the lifestyle they currently lead. These combined effects would manifest as nuisance factors for a resident daily.

Receptor/ Resource	Process/ Activity	Social Impact	Impact effect	Magnitude (M)	Duration (D)	Scale(S)	Probability (P)	Significance	
								Rating	Value
Social area of influence (Mr. Vogel and farmworkers)	Construction phase of the mine and its associated activities – shaft sinking, blasting.	Reduced quality of life	Negative	10 [8]	5 [5]	2 [2]	5 [5]	High [High]	85 [75]

Mitigation and Management

- All the mitigation measures from the associated specialist reports would need to be implemented.
- A "social buffer" would need to be created. This refers to a buffer zone surrounding the footprint that will be a "no-go" zone for residents, children and animals such to protect them from fly-rock especially. Other specialist studies have suggested 500m from the blasting site as a zone for mitigation measures and it is a mitigation and management recommendation that 500m from the blasting would be a physical fenced boundary.

Impact Monitoring

Monitoring	Time Frame for Monitoring
- The physical fenced boundary of the social buffer would need to patrolled to ensure that no children, adults or animals enter the footprint.	Daily monitoring

Health Impacts

Increased levels of nuisance factors leading to increased levels of stress.

All anticipated outcomes from the *Specialist Reports A-F* mentioned result in a cumulative effect of disrupting the daily life that Mr. Vogel and the Farmworkers are used to, which are indications of change.

Change can be very stressful for people especially when it occurs on so many different levels, and for the expected duration of 4 years of construction. It would also be known by the people that the construction would be preceded by over 10 years of operation. These factors can be stressful for Mr. Vogel who would be 730m away from the area where blasting would take place and for the farm workers who would be 1500m away from the blasting area. This proximity can elevate the level of change experienced and therefore stress as well.

Receptor/ Resource	Process/ Activity	Social Impact	Impact effect	Magnitude (M)	Duration (D)	Scale(S)	Probability (P)	Significance	
								Rating	Value
Social area of influence (Mr. Vogel and farmworkers)	Construction phase of the mine and its associated activities – shaft sinking, blasting.	Increased levels of nuisance factors leading to increased levels of stress	Negative	8 [6]		2 [2]	5 [4]	High [Medium]	65 [44]

Mitigation and Management

- ❖ All mitigation and monitoring measures of other specialist reports considered would need to be implemented.
- ❖ This would need to be mitigated on an individual level by the respective stakeholder as each person responds to stress and significant life events differently. This could be addressed and monitored by the respective complaints received.

Community Impacts

Livelihood impact due to limited land to farm

The impact on livelihood would be relevant to Mr. Vogel as well as the farmworkers.

Mr. Vogel would have a significantly smaller portion of land to generate an income from under conditions in this phase that would not favour the model of farming that he uses. Mr. Vogel's farming model includes the farming of livestock as well as agriculture as entities that complement one another and make the business viable. *Specialist Report B* suggests that livestock could be startled by the sound of blasting and would need to be at least 500m away from the area of blasting as mitigation. The extent and size of land that would be available to Mr. Vogel for farming should this scenario (i) be chosen would need to be fully clarified. It is anticipated that there will be challenges with trying to farm with livestock and agriculture during this phase, such as keeping livestock safe at a camp that is close to the main road, such that the livestock is further away as suggested in the mitigation measures; dust and smoke that could affect crops.

With the reduced size of land to farm with, a reduced workforce may be required. This may mean the downscaling of Mr. Vogel's workforce on the farm which would lead to some of the farmworkers losing their jobs and housing.

Receptor/ Resource	**Process/ Activity**	**Social Impact**	**Impact effect**	**Magnitude (M)**	**Duration (D)**	**Scale(S)**	**Probability (P)**	**Significance**	
								Rating	Value
Social area of influence (Mr. Vogel and farmworkers)	Construction phase of the mine and its associated activities – shaft sinking, blasting.	Livelihood impact due to limited land to farm	Negative	10 [4]	5 [5]	2 [2]	5 [4]	High [Medium]	85 [44]

Mitigation and Management

- All the mitigation measures from the associated specialist reports would need to be implemented.
- Compensation for Economic Displacement for Mr. Vogel would need to be carried out by Gold One.
- An agreement for fair compensation would need to be signed by all parties involved.

- The genuine viability of the model of farming livestock and agriculture in this new circumstance would need to be investigated.
- If the model of farming does not accommodate all of the existing farmworkers, Livelihood restoration of those farmworkers would need to be considered and implemented.

Land Use Impacts

Reduced portion of land for farming

As indicated in the findings of the *Specialist Report E* on soil and land capability, a medium significance rating was found with mitigation measure in place. A core issue for consideration with this impact is the size of the farm that would be allocated for farming, would be significantly smaller than its current size. This means that the viability of farming would need to be evaluated in the case of Mr. Vogel due to the model of farming that he follows which includes the livestock as well as the agriculture that makes it viable for him (as explained in the section on stakeholders).

Receptor/ Resource	Process/ Activity	Social Impact	Impact effect	Magnitude (M)	Duration (D)	Scale(S)	Probability (P)	Significance	
								Rating	Value
Social area of influence (Mr. Vogel and farmworkers)	Construction phase of the mine and its associated activities – shaft sinking, blasting.	Reduced portion of land for farming	Negative	10 []	5 []	2 []	5 []	High []	85]

Mitigation and Management

- All mitigation and monitoring measures of other specialist reports considered would need to be implemented.

Community Impacts

Livelihood impact due to limited land to farm

The impact on livelihood would be relevant to Mr. Vogel as well as the farmworkers.

Mr. Vogel would have a significantly smaller portion of land to generate an income from under conditions in this phase that would not favour the model of farming that he uses. Mr. Vogel's farming model includes the farming of livestock as well as agriculture as entities that complement one another and make the business viable. *Specialist Report B* suggest that livestock could be started by the sound of blasting and would need to be at least 500m away from the area of blasting as mitigation. The extent and size of land that would be available to Mr. Vogel for farming should this scenario (i) be chosen would need to be fully clarified. It is anticipated that there will be challenges with trying to farm with livestock and agriculture during this phase, such as keeping livestock safe at a camp that is close to the main road, such that the livestock is further away as suggested in the mitigation measures; dust and smoke that could affect crops.

With the reduced size of land to farm with, a reduced workforce may be required. This may mean the downscaling of Mr. Vogel's workforce on the farm which would lead to some of the farmworkers losing their jobs and housing.

Receptor/ Resource	Process/ Activity	Social Impact	Impact effect	Magnitude (M)	Duration (D)	Scale(S)	Probability (P)	Significance	
								Rating	Value
Social area of influence (Mr. Vogel and farmworkers)	Construction phase of the mine and its associated activities – shaft sinking, blasting.	Livelihood impact due to limited land to farm	Negative	10 [4]	5 [5]	2 [2]	5 [4]	High [Medium]	85 [44]

Mitigation and Management

- Livelihood restoration would need to be considered for the farmworkers if there is a reduced workforce.

5.2.2.2. Impacts that address scenario (ii): Gold One buys Mr. Vogel's farm and there is physical and economic displacement of Mr. Vogel

Community Impacts

Physical displacement of farmer and farmworkers directly affected

Mr. Vogel's dwelling as well as 8 dwellings where some of his employees live, are in the surrounds of the footprint of the mine site. There are currently an estimated 6 families who live in the dwellings and are comprised of an estimated 30 people who would be affected at the farm worker's dwellings. There are therefore an estimated 35-40 people who are living outside the footprint including people at Mr. Vogel's dwelling.

The current standing of the arrangement between Mr. Vogel and the farmworkers who work for him, is that there is a private agreement which broadly manifests as one where the farmworkers can live in the dwellings provided by Mr. Vogel on his farm for the duration that they are employed by him for, as an employee benefit. Therefore, the land and the buildings fundamentally belong to Mr. Vogel.
There are therefore two sections of the Extension of Security of Tenure Act, 1997 (Act No. 62, 1997) that are valuable to consider in these scenarios:

- Section 8 (1) states that subject to the provisions of this section, an occupier's rights of residence maybe terminated on any lawful ground, provided that such termination is just and equitable;
- Section 8 (2) of the states that the right of residence of an occupier who is an employee and whose right of residence arises solely from an employment agreement, may be terminated if the occupier resigns from employment or is dismissed according with the provisions of the Labour Relations Act.

Therefore, according to the current legislative circumstance between Mr. Vogel and the farmworkers, the farmworkers leaving the dwellings would be a private matter between Mr. Vogel and the farmworkers.

Receptor/ Resource	**Process/ Activity**	**Social Impact**	**Impact effect**	**Magnitude (M)**	**Duration (D)**	**Scale(S)**	**Probability (P)**	**Significance**	
								Rating	Value
Social area of influence (Farmers Mr. Vogel and staff members who live on his farm)	Preparation of the mine site for construction.	Physical displacement of farmer and farmworkers directly affected	Negative	10 [6]	5 [5]	2 [2]	5 [5]	High [High]	85 [65]

Mitigation and Management

- A Livelihood Restoration Plan would need to be created for the farmworkers who would be affected by this action of displacement of Mr. Vogel;

- Possible referrals to other farmers in the vicinity could be investigated.

Loss of income of farmer indirectly affected

The potential loss of income of the farmer is mostly related to Mr. Coetzer who is indirectly impacted. In this particular scenario, some of the land is leased by Mr. Vogel, so if he was physically displaced, it would mean a loss of income for Mr. Coetzer as well. Mr. Coetzer also has a dairy of an estimated 30 dairy cows outside the footprint of the mine, and in this phase, it has the potential to affect his livestock by disturbing them for a short period as it would be expected that they would adapt to the new circumstance. He also farms livestock and the heard is of an estimated 90 animals. It is expected that they would adapt to the effects of noise quite easily.

Receptor/ Resource	Process/ Activity	Social Impact	Impact effect	Magnitude (M)	Duration (D)	Scale(S)	Probability (P)	Significance	
								Rating	Value
Social area of influence (Farmers Mr. Vogel and Mr. Theron)	Construction of mine	Loss of income of famers who are directly affected	Negative	10 [10]	4 [4]	2 [2]	5 [5]	High [High]	80 [80]

Mitigation and Management

- The land portion Flippie 738 that was previously leased to Mr. Vogel could be used to move the animals to such that they are further away from the noise impacts of blasting.

Land Use Impacts

Mr. Vogel and farmworkers would no longer be residents outside of the mine footprint

The effect of the physical displacement of Mr. Vogel is that it reduces the risk for Gold One for the possibility of negative incidents that could possibly occur with having adults, children and animals immediately surrounding the footprint of the mine. It means the land could be used as a buffer between the mine and Phomolong which would be beneficial for future circumstances. It also means he would not be exposed to further impacts of the mine.

Receptor/ Resource	Process/ Activity	Social Impact	Impact effect	Magnitude (M)	Duration (D)	Scale(S)	Probability (P)	Significance	
								Rating	Value
Social area of influence (Farmers Mr. Vogel and Mr. Theron)	Construction of mine	Mr. Vogel and farmworkers no longer outside mine footprint	Positive	10 [10]	4 [4]	2 [2]	5 [5]	High [High]	80 [80]

5.2.2.3. Community (General) Impacts

In-migration of people and workers

The in-migration of people and workers to an area due to projects that are anticipated to bring growth to an area is not uncommon. The extent of this impact is always difficult to predict, quantify and manage. The current high unemployment rate in the region, as well as the downscaling of mining in the province over the last decade, may encourage people from other localities to be drawn to the area in search of employment or procurement opportunities.

It is anticipated that long term contractors would establish accommodation on site for the duration of the construction. The long-term activities would largely be related to shaft-sinking. It is important to distinguish between the construction workers and the inflow of job seekers in a broader sense, as the latter would be more unpredictable, difficult to manage, and would likely be long term, adding to existing pressure on limited facilities and services.

Receptor/ Resource	Process/ Activity	Social Impact	Impact effect	Magnitude (M)	Duration (D)	Scale(S)	Probability (P)	Significance	
								Rating	Value

Social area of influence (Ventersburg, Hennenman, Phomolong, Whites)	Activity at mine that indicates start of construction.	Inflow of people and workers	Negative	10 [10]	3 [3]	2 [2]	4 [4]	High [High]	60 [60]

Mitigation and Management

- The management of expectations regarding job creation and the number of jobs that would be available at the mine and would be sourced from local communities would need to be clear.
- There can be a document and copies of it in key localities that address the procurement requirements and procedures that could help inform the people who are interested.
- It would be valuable for the Local Municipality and the mine to collaborate in managing the process of registration for jobs and form a good working relationship between Local Government and the Mine from the onset.
- The Local Municipality would also need to assist with the management of the growth of the informal section of Phomolong.
- The indicator used to monitor and manage this impact would be population growth as well as the increase in the number of dwellings in Phomolong and particularly the informal extension.
- A certain degree of the inflow of people can be anticipated by the numbers of contractors and employees who would be recruited to partake in the activities and endeavours associated with sinking of the mine, setting up the headgear, dewatering the mine and setting up of electricity to it, as some of the activities in question. This can create an estimated anticipated inflow of people to the project area. It also allows for the difference to be determined between the inflow of employees versus the inflow of job seekers in a broad sense. It is an important distinction to make as the one group would have employment and the other may not necessarily obtain employment, which could increase the local population likely in the long term and increase the pressure on local infrastructure, which would not be foreseen.

Impact Monitoring	
Monitoring	Time Frame for Monitoring

- Data of the estimated populations of Phomolong, Ventersburg, Hennenman and Whites communities respectively prior to mining, be captured, which has been done in this report. - Data of these populations figures captured again before, half way through the construction phase and after the construction phase has taken place. - Data of these populations figures again at the year that the mine opens and every year following. - Continuous and effective law enforcement would need to take place from the municipality to ensure people do not settle on privately owned land. - Continuous monitoring of the number of dwellings in the Phomolong informal extension.	The holistic timeframe for the monitoring of this impact would be from the inception of the construction phase, right through to the closure of the mine.

Social implications of a construction camp

A construction camp and its social implications are connected to the inflow of people in the area, of which there can be extensive effects for surrounding communities. It has the potential to affect the social fabric of the local communities that it is positioned close to as it can result in the formation of short term relationships with people in surrounding communities. This can disrupt the family life and social structures of the local community and in this case Phomolong. It can also lead to the spread of sexually transmitted diseases (STDs) to and within the local community setting. It can lead the increased possibility of veld fires which is a large hazard to consider given the location of Phomolong (being surrounded by grasslands) and the informal housing in the outer parts of the township which would likely be affected should it occur.

The construction camp is estimated to be around 250 people who will be living at the site during construction.

Receptor/ Resource	**Process/ Activity**	**Social Impact**	**Impact effect**	**Magnitude (M)**	**Duration (D)**	**Scale(S)**	**Probability (P)**	**Significance**	
								Rating	Value
Social area of influence (Ventersburg, Henneman, Phomolong, Whites)	Activity at mine that indicates start of construction.	Social implications of a construction camp.	Negative	6 [2]	2 [2]	2 [2]	4 [4]	Medium [Low]	40 [24]

Mitigation and Management

- The site of the construction camp, its locality is an important element in the management of the social impacts on surrounding communities. Distance can encourage or discourage the engagement of people in surrounding social systems and due to a construction camp possibly being of negative social consequence, the following is considered.
- The approximate distance between Hennenman and Virginia is 25km, which translates into an estimated 25 min driving time; and Hennenman and Welkom are approximately 36km apart which translates into an estimated 30 min driving time. These towns are within range of the proposed mine site (within 30min) and have established facilities from previous mines in the vicinity which have closed. This allows for the opportunity for the use of the existing infrastructure for what would be a "construction camp" or construction community. This scenario would leave minimal social effects in the social area of influence of the project. Employees who would have lived in the construction camp could be encouraged to live in facilities in Welkom or Virginia that would allow for a smaller construction camp in the vicinity.
- This situation can be enabled by a "bus in bus out" system that is described and identified in the case study example of Beatrix.
- A busing in and busing out system can be created to minimize the effects of the Construction Phase on the surrounding communities.

Impact Monitoring	
Monitoring	Time Frame for Monitoring
- The effectiveness of the transport system would need to be measured in order to make sure that it is ensuring the results that are desired for this phase. This is essentially a minimal change in the Phomolong Township. - A live out allowance can be given as an option to workers who would normally live in the construction camp to encourage integration into surrounding towns. - The base of this monitoring would be the changes that would be evident in Phomolong on the levels of: • Dust; measured by air quality studies, • Spread of disease., measured by data from the clinic.	Whole period of the Construction Phase of the Mine. These would need to be measured on a monthly basis during the Construction Phase.

Pressure on infrastructure from influx and overcrowding

The state of the R70 road that would be the key road that would feed vehicles into the mining site is currently in a bad condition with severe potholes that appear on it between Ventersburg and Hennenman. Increased traffic volumes on this road would likely lead to the further deterioration of the road, which has the ability to affect the safety of the people who drives vehicles on that road. These and further elements were addressed in *Specialist Report C.* The further pressure on infrastructure extends to the facilities of Phomolong, which are already under pressure and in need

of attention and extension. This is also relevant to the shops, Police Station, Clinic and schools. The influx and overcrowding would add to the already existing demand on the infrastructure mentioned.

Receptor/ Resource	Process/ Activity	Social Impact	Impact effect	Magnitude (M)	Duration (D)	Scale(S)	Probability (P)	Significance	
								Rating	Value
Social area of influence (Ventersburg, Hennenman, Phomolong,)	Mining activity in its construction phase	Pressure on infrastructure	Negative	10 [8]	4 [4]	2 [2]	5 [5]	High [High]	80 [70]

Mitigation and Management

- Mitigation measures as stipulated in the Traffic Assessment, *Specialist Report C*.
- In-Migration Plan formation that would address how influx would be addressed and managed that is specific and applicable to the local environment.

Possible rise in crime levels

The increase of people in the local area may lead to a possible increase in the level of crime in the area due to the array of people that may be drawn to the area.

Receptor/ Resource	Process/ Activity	Social Impact	Impact effect	Magnitude (M)	Duration (D)	Scale(S)	Probability (P)	Significance	
								Rating	Value
Social area of influence (mainly Phomolong and surrounding farmers)	Rise in the population due to employment of mine workers and inflow of people.	Possible rise in crime levels	Negative	6 [4]	3 [3]	3 [2]	3 [3]	Medium [Low]	36 [27]

Mitigation and Management

- ❖ Establishment of more regular police patrols could be implemented by the Police and municipality to monitor and control crime.
- ❖ Gold One would have their own security measures in place to keep the mine and employees safe on the mine. This is usually headed by a Safety Officer from the mine with specific recommendations and procedures that are industry specific.
- ❖ The indicator used to monitor the increase or decrease in crime would be the interviews conducted with the police, which would come from the number of occurrences of the respective crimes in that month.

Impact Monitoring	
Monitoring	Time Frame for Monitoring
- A representative from the Phomolong Police Station cold report back to and give feedback to the Sustainable Growth Committee regarding the state of challenges in Phomolong with regard to safety.	Meeting at the end of every month from when the construction of the mine commences.

General Health Impacts

Rise of disease in the social area of influence.

In-migration of people into an area seeking jobs as well as contractors employed to do the sinking of the shaft and the setting up of the mine, results in a significantly larger number of people in the project surrounds than what is customary. It has the potential to lead to more interactions between members of the local community such as Phomolong, which is positioned in close proximity to the intended area of the mine, and can stimulate the spread of disease. Some of the diseases which could be in question could be Tuberculosis (TB) and Sexually Transmitted diseases such as HIV/AIDS. With the construction of the mine and the sinking of the shaft, there may be the perception that there will be increased levels of dust in the air that may lead to the increase in Respiratory Tract Infections during this period. However, according to the *Specialist Report C* addressing blasting, dust suppression measures will be implemented and therefore dust should be confined to the footprint.

Receptor/ Resource	**Process/ Activity**	**Social Impact**	**Impact effect**	**Magnitude (M)**	**Duration (D)**	**Scale(S)**	**Probability (P)**	**Significance**	
								Rating	Value

Social area of influence (Phomolong)	Construction of the mine and associated activities	Rise of disease in the social area of influence	Negative	6 [6]	3 [3]	2 [1]	3 [3]	Medium [Medium]	33 [30]

Mitigation and Management

- Awareness regarding HIV/AIDS, TB and sexually transmitted diseases can be created by means of an awareness campaign upon orientation period of the mine site. This can occur in Phomolong simultaneously.
- Mitigation measures of dust suppression as per *Specialist Report B.*
- Voluntary testing or counselling could be provided by the mine for employees.

Impact Monitoring	
Monitoring	Time Frame for Monitoring
- The same data that would be used in the previous impact would be applicable in the monitoring of this impact- data from the clinic would be analysed to see if there has been a change in numbers related to sexually transmitted diseases, HIV/ AIDS or Respiratory Tract Infections.	This could be monitored every quarter during the Construction Phase of the mine.

General Quality of life Impacts

Change in sense of place

The increased presence of more people in the area who would be doing the work of sinking the shaft and setting up of services of the mine, is likely to change the sense of place for the surrounding farmers from a more rural quieter set up to one where is increased traffic and encounters with contractors and mine employees. The presence of mining infrastructure at the end of the construction phase, such as the headgear will also change the visual impressions of the area which will affect the sense of place. According to *Specialist Report D* addressing visual aesthetics, the visual impact it is rated as a high impact without mitigation and a medium impact with mitigation.

Receptor/ Resource	**Process/ Activity**	**Social Impact**	**Impact effect**	**Magnitude (M)**	**Duration (D)**	**Scale(S)**	**Probability (P)**	**Significance**	
								Rating	Value

Social area of influence (surrounding farmers)	Sinking the shaft and setting up of associated services for the mine.	Change in the sense of place for surrounding farmers	Negative	6 [4]	5 [5]	2 [2]	5 [4]	High [Medium]	65 [44]

Mitigation and Management

- Mitigation as suggested in the Traffic Assessment (*Specialist Report C)* as well as the Visual Aesthetics Assessment *(Specialist Report D)*.

5.3. Operation Phase Impacts

The way in which this section is structured is important to take into account: there the section that addresses the **scenarios** as previously indicated (i.e. (i): Mr. Vogel and Farmworkers remain in current dwellings; (ii): Mr. Vogel and farmworkers vacate the dwellings and property (physical and economic displacement of Mr. Vogel) as well as the respective theme that is being addressed (i.e. quality of life impact), and then there are **general impacts** which are classified as such, all for the **operation** phase. This provides a clear indication of the impacts that would be anticipated for each scenario.

5.3.1. Positive Operation Phase Impacts

5.3.1.1. Impacts that address scenario (i): Mr. Vogel and Farmworkers remain in current dwellings

None foreseen.

5.3.1.2. Impacts that address scenario (ii): Mr. Vogel and farmworkers vacate the dwellings and property

Community Impacts

Mr. Vogel and farmworkers will not be exposed to operational phase impacts in this scenario.

5.3.1.3. General Positive Community Impacts

Possible economic growth of the local towns of Hennenman and Ventersburg

The opening of a mine in the vicinity between Hennenman and Ventersburg has the possibility to act as a stimulus for economic growth in the towns. This would be based on the increased number of

people to the town and the demands that would come with a larger population that has a disposable income as well as the associated businesses that may start up as a result of the demand in the area in the respective industries.

Receptor/ Resource	Process/ Activity	Social Impact	Impact effect	Magnitude (M)	Duration (D)	Scale(S)	Probability (P)	Significance	
								Rating	Value
Social area of influence (Ventersburg and Hennenman)	Opening and operational phase of the mine	Economic growth of the local towns of Hennenman and Ventersburg	Positive	6 [8]	3 [3]	2 [2]	3 [3]	Medium [Medium]	33 [39]

Mitigation and Management

- The data collected for the indicators of the growth of the respective towns and communities that fall within the surrounds can be done by a forum of the VPHW (Ventersburg, Phomolong, Hennenman, Whites) Sustainable Growth Committee that can be formed and occur once a quarter. Key issues, opportunities and successes can be mentioned at this forum and it can manifest as a platform where the vision of these places is discussed and aimed toward. Members would come from a variety of different industries such as the gold mining industry, farming, municipal services, education etc.
- The nature of this committee is that it would be consultative in nature.

Impact Monitoring	
Monitoring	Time Frame for Monitoring
- VPHW Sustainable Growth Committee meetings once a quarter - Minutes of the meetings held at the forums.	- Once every year from the construction phase of the mine to its closure.

Possible growth of businesses and entrepreneurial ventures

With the increased number of people in the vicinity, there would be a greater need for services and produce that poses as an opportunity for businesses. It would likely be related to the food industry and possible services that the mine would need that could possibly be outsourced (possibly like cleaning businesses, etc.). It could also manifest as Small Business Enterprises in surrounding communities.

Receptor/ Resource	Process/ Activity	Social Impact	Impact effect	Magnitude (M)	Duration (D)	Scale(S)	Probability (P)	Significance	
								Rating	Value
Social area of Influence (Ventersburg, Hennenman, Phomolong, Whites)	Functioning of the gold mine in the vicinity	Possible growth of businesses and entrepreneurial ventures	Positive	6 [8]	2 [2]	2 [2]	3 [3]	Medium [Medium]	30 [36]

Mitigation and Management

- Opportunities can be explored by Gold One to see where they would be able to draw services and resources from the local economy to ensure the empowerment of the local setting. This could be in the form of getting supplies from local food outlets or farmers for example.

Employment opportunities

The different phases of the mine have different needs when it comes to the theme of employment. This means that the Construction, Operation and Closure Phases have different numbers of people who would be expected to work for those phases.
It is aimed that there will be a percentage of the labour force that would be sourced from communities in the local setting but it is important to clarify that not all of the employment opportunities created by the mine will be directed toward local and surrounding communities. This is due to a component of the employees would be skilled employees who have the skill set that is needed for the effective formation and functioning of a gold mine.

It is anticipated that there would be approximately 300 employment opportunities available in the Construction Phase of the mine in total; an estimated 1900 employment opportunities in total during Operation Phase and an unknown amount of employment opportunities available for the Closure Phase.

Receptor/ Resource	Process/ Activity	Social Impact	Impact effect	Magnitude (M)	Duration (D)	Scale(S)	Probability (P)	Significance	
								Rating	Value
Social area of influence (Ventersburg, Hennenman, Phomolong, Whites)	Employment search by Gold One for the mine.	Employment opportunities	Positive	10 [10]	4 [4]	2 [2]	5 [5]	High [High]	80 [80]

Mitigation and Management

- Clearly defined requirements and recruitment process must be explained and clarified to candidates who are searching for employment at the mine. This allows for expectations to be clear and a platform for functioning of the process.
- A workshop could be held that briefs people about the format and layout of a CV. This would assist in getting the formats of the CVs in a similar form so that it can easily be compared. It would also be a beneficial skill for people attending the workshop to have.
- The registration process as previously mentioned would also form an important part of this mitigation.
- The indicator for this impact would be how many of the people from the local settings of Phomolong, Whites, Ventersburg and Hennenman are employed.

Impact Monitoring	
Monitoring	Time Frame for Monitoring
- Registration process involving the building of a database of respective people interested in which phase of the operation for employment. - A question can be asked on the registration form when CVs are handed in that asks where the person is from. This can be a source of data that can be referred to after the recruitment process to investigate how many people from the surrounding environments were employed. - The number of people employed from the local surrounding environment could be monitored	- Planning phase of the mine. - After the recruitment process. - Annual monitoring

Cultural Impacts

Possible alleviation of poverty levels

During the data collection process, it became apparent that hunger is a major challenge in the vicinity and this is reflective of the level of poverty that the people encounter of a daily basis. The opportunities that would be posed to the local community in terms of employment as well as the expected growth of the area, should result in an increase opportunity for employment or self-employment in response to the business activity of the area. This in turn could provide a means for some families to live without the challenge of hunger as well as possibly elevate a part of the standard of living of the people who are employed with the mine.

Receptor/ Resource	Process/ Activity	Social Impact	Impact effect	Magnitude (M)	Duration (D)	Scale(S)	Probability (P)	Significance	
								Rating	Value
Social area of influence (Phomolong)	Functioning of the mine and employment of local community members.	Possible elevation of poverty levels.	Positive	10 [10]	3 [4]	2 [1]	3 [4]	Medium [High]	45 [60]

Mitigation and Management

- The positive effect of the alleviation of poverty levels can be enhanced through campaigns that educate people about the importance of health.

Possible transformation of culture of the youth

Unemployment among the youth has been revealed in interviews to be a large challenge in the area when the youth remains in the area and engages in gang activities often as a result of that. A mine coming to the area that designs itself to be attractive to the youth would potentially encourage the seeking of employment as an alternative to their current options. Other generations would also be included in terms of the experience that would be needed in the industry and operations of the mine, which can also serve as a form of mentorship and hand over of the other skills to a new generation.

The ability to capture the attention of the youth in Phomolong for the labor force of the mine, has the potential to allow for positive social change in the area. It also offers the opportunity for the mine to train individuals with the required skills.

Receptor/ Resource	Process/ Activity	Social Impact	Impact effect	Magnitude (M)	Duration (D)	Scale(S)	Probability (P)	Significance	
								Rating	Value
Social area of influence (Phomolong)	Functioning of the mine and employment of local community members.	Transformation of culture of youth	Positive	10 [10]	4 [4]	2 [2]	3 [4]	Medium [High]	48 [64]

Mitigation and Management

- Monitoring the age and origin of the youth that may work for the mine.

Impact Monitoring	
Monitoring	Time Frame for Monitoring
- Focus group with police regarding changes or lack of changes that are seen in criminal activity of the youth. - Have a principal who is a representative on the Sustainable Growth Committee and gives feedback regarding the changes in the attitudes and behaviour of the youth and whether or not it is transforming in a positive manner.	Operational phase and could occur once every year.

5.3.2. Negative Operation Phase Impacts

5.3.2.1. Impacts that address scenario (i): Mr. Vogel and Farmworkers remain in current dwellings

The outcomes of other specialist reports that are needed for considering in the quantifying of the social impacts are as follows:

- The state of **air quality** has a **low** significance rating with mitigation according to *Specialist Report A*. It also conveys the following information:
- The gases that would be released are specified in *Specialist Report A* and are within the range allowed by the NAAQS limits with mitigation;
- The TSF fallout is predicted to be below the residential limit for all the core directly and indirectly affected stakeholders in Figure 31 at the beginning of the section with mitigation.

- The *Specialist Report B* on **blasting** addresses the implications on ground vibration, and it is indicated as having a **low** significance rating as blasting at 570m underground should not influence the surface infrastructure;

- *Specialist Report C* on **traffic** suggests a **low** significance rating with mitigation;

- *Specialist Report D* on **visual aesthetics** suggests a **medium** significance rating with mitigation. This would be due to the TSF and WRD as well as the nuisance effect to residence of the lighting in the night.

- *Specialist Report E* on **soil and land capability** suggests a **medium** significance rating with mitigation. It is important to consider that soil and wind erosion is expected. The TSF area, WRD area and shaft area is also an area where its location will not be able to be used for agriculture or livestock farming.

- *Specialist Report F* on **noise** suggests a **medium** significance rating with mitigation as it is not foreseen that the noise expected in the daytime or night time would be higher than the South African National Standards (SANS) limits for rural or urban environments for the majority of the stakeholders, except for Mr. Vogel and Mr. Coetzer's dwellings at night.

- *Specialist Report G* on **TSF stability** has a **low** significance rating with mitigation. The TSF has the highest risk for the failure of the TSF in a worst-case scenario, it would be in a liquid form and flow down the respective gradient. If there was a breach, the model suggests that it would not reach the stakeholders of Mr. Vogel, Mr. Coetzer and the farmworkers if they were still living in their dwellings in this phase.

Quality of Life Impacts

Decrease in quality of life of stakeholders surrounding the footprint of the mine

The above impacts are important in understanding the effects of the mine that would have on stakeholders that surround the footprint of the mine. The cumulative effects from *Specialist Report C, D, E, and F*, addressing traffic, visual aesthetics, soil and land capability and noise elements are significant because they would be nuisance factors to stakeholders such as Mr. Vogel, Mr. Coetzer and the farmworkers who live on Mr. Vogel's property. The quality of life of these stakeholders would decrease considering these effects combined and is reflected in the impact table below.

Receptor/ Resource	Process/ Activity	Social Impact	Impact effect	Magnitude (M)	Duration (D)	Scale(S)	Probability (P)	Significance

								Rating	Value
Social area of influence (Mr. Vogel, farmworkers, Mr. Coetzer)	Operational phase of the mine	Decrease in quality of life	Negative	10 [10]	4 [4]	2 [2]	4 [4]	High [High]	64 [64]

Mitigation and Management

- Mitigation for these factors has already been included in the respective specialist reports and from a social perspective these effects are added cumulatively, which cannot be mitigated further.

Health Impacts

Impact on health of stakeholders surrounding the footprint of the mine

The air quality study, *Specialist Report A*, suggests that with the implementation of the recommended mitigation measures, air quality standards will not be exceeded at the mine boundary therefore no health implications that are expected with the mitigation measures of *Specialist Report F* . Without the implementation of the recommended mitigation measures, the noise factor at night for stakeholders Mr. Vogel and Mr. Coetzer may have a negative effect on sleeping patterns, which may have a negative effect on physical and mental health. Both these factors are considered in the rating below.

Receptor/ Resource	**Process/ Activity**	**Social Impact**	**Impact effect**	**Magnitude (M)**	**Duration (D)**	**Scale(S)**	**Probability (P)**	**Significance**	
								Rating	Value
Social area of influence (Mr. Vogel, farmworkers, Mr. Coetzer)	Operational phase of the mine	Impact on health	Negative	6 [4]	4 [4]	2 [2]	4 [4]	Medium [Medium]	48 [40]

Mitigation and Management

- Mitigation for these factors has already been included in the respective specialist reports.
- Due to the different levels of noise that different people can tolerate before falling asleep, makes this significantly difficult to mitigate.

- If numerous complaints are received additional mitigation measures of water features/ fountains can be built outside of bedrooms that would play a role in screening out the noise of the operations with the sound of water falling, which may assist with sleep. The success of this would largely be dependent on the individual and feedback could be given once it is implemented.

Community Impacts

Change in cultural landscape

The findings of Specialist Report D and E addressing visual aesthetics and land capability illustrate a landscape that is going to change significantly and it would need to be deemed viable/ not viable by Mr. Vogel about whether the change in capability of the land as well as the all the impacts experienced in this phase for at least a 10-year period, would be worth the outcome of a change landscape at the end. The cultural landscape is a landscape that combines the physical place with the meaning of the place to the people. This may change significantly for Mr. Vogel.

Receptor/ Resource	Process/ Activity	Social Impact	Impact effect	Magnitude (M)	Duration (D)	Scale(S)	Probability (P)	Significance	
								Rating	Value
Social area of influence (Phomolong)	Operational phase of the mine	Change in cultural landscape	Negative	10 [10]	5 [5]	2 [2]	4 [4]	High [High]	6 [68]

Mitigation and Management

- Mitigation for these factors has already been included in the respective specialist reports and from a social perspective these effects are added cumulatively, which cannot be mitigated further.

5.3.2.2. Impacts that address scenario (ii): Mr Vogel and farmworkers vacate their current dwellings and property

It means that there will be no negative impacts on quality of life, health, community, cultural or land use impacts on Mr. Vogel and the farmworkers, as caused by the mining operation.

5.3.2.3. General Impacts

General Community Impacts

Possibility of illegal mining attracted by mining activity

A mine has the potential to draw illegal miners to it as a part of people that are pulled towards the opportunities that it may present. This possibility would need to be considered as it has been prevalent in some of the other mines in the Free State area. It would be a factor that would affect the mine largely in terms of the safety systems that the mine would need to implement and manage.

Receptor/ Resource	Process/ Activity	Social Impact	Impact effect	Magnitude (M)	Duration (D)	Scale(S)	Probability (P)	Significance	
								Rating	Value
Social area of influence (Mine site, Phomolong)	Operating of the gold mine.	Possibility of illegal mining in the area attracted by mining activity.	Negative	8 [6]	5 [5]	2 [2}	3 [3]	Medium [Low]	45 [17]

Mitigation and Management

- Gold One could investigate the implementation that recent technologies that could assist with the safety of the operation, both the mineral and the people in the process.
- The mitigation and management of this impact would usually be dedicated to the security division of a mine that would have specialist knowledge of its mitigation and management.

Possible increase in criminal activity

The increase in the number of people in the area, high levels of poverty, unemployment and the possible elevation of the standard of living of some of the people within the community may pose as a target for criminal activity to manifest on a more prevalent level. This would likely affect communities that are in close proximity to the mine site, which could therefore affect the surrounding farmers as well as Phomolong.

Receptor/ Resource	Process/ Activity	Social Impact	Impact effect	Magnitude (M)	Duration (D)	Scale(S)	Probability (P)	Significance	
								Rating	Value
Social area of influence (Farmers surrounding the mine site and Phomolong)	Operation of the mine	Possible increase in criminal activity	Negative	6 [4]	4 [4]	2 [2]	3 [2]	Medium [Low]	36 [20]

Mitigation and Management

- A consideration of the extra police presence can be put forward to the MLM which may mean patrols in Phomolong and the immediate surrounds of the mine.
- The Police Force of the area would have specialist knowledge of its mitigation and management about this process in operational phase.

General Health Impacts

Impact on health of surrounding communities

According to *Specialist Report A* addressing air quality, the impact on air quality with mitigation is of a low significance rating; and the noise is a medium significance rating with mitigation, from *Specialist Report F.* The combined factors are not expected to have a largely negative effect on health for surrounding communities such as Phomolong, Whites and the farmers in the larger vicinity.

Receptor/ Resource	Process/ Activity	Social Impact	Impact effect	Magnitude (M)	Duration (D)	Scale(S)	Probability (P)	Significance	
								Rating	Value

Social area of influence (Surrounding farmers, Phomolong, Whites)	Operational phase of mine	Impact on health of surrounding communities	Negative	4 [2]	4 [4]	2 [2]	3 [3]	Medium [Low]	30 [24]

Mitigation and Management

- Monitoring recommendations as in the Special Reports A and F;
- If issues with health arise it can be directed toward the Sustainable Steering Committee if it is a community issue.

5.4. Decommissioning Phase Impacts

The outcomes of other specialist reports that are needed for considering in the quantifying of the social impacts are as follows:

- The state of **air quality** has a **low** significance rating with mitigation according to *Specialist Report A*. It also conveys the following information:
- The gases that would be released are specified in *Specialist Report A* and are within the range allowed by the NAAQS limits with mitigation;
- The TSF fallout is predicted to be below the residential limit for all the core directly and indirectly affected stakeholders in Figure 31 at the beginning of the section with mitigation;

- *Specialist Report C* on **traffic** suggests a **low** significance rating with mitigation on the road safety element;

- *Specialist Report D* on **visual aesthetics** suggests a **low** significance rating with mitigation;

- *Specialist Report E* on **soil and land capability** suggests a **low** significance rating with mitigation as per the Ventersburg Closure Plan. It is important to consider that soil and wind erosion is expected. The TSF area, WRD area and shaft area is also an area where its location will not be able to be used for agriculture or livestock farming which has a **high** significance rating;

- *Specialist Report F* on **noise** suggests a **low** significance rating with mitigation as it is not foreseen that the noise expected in the daytime or night time would be higher than the South African National Standards (SANS) limits for rural or urban environments for the majority of the stakeholders as noise would occur during the daytime;

- *Specialist Report G* on **TSF stability** has a **low** significance rating with mitigation as the contents in the TSF dries over time which reduces risk.

5.4.1. Impacts that address scenario (i): Mr. Vogel and Farmworkers remain in current dwellings

Quality of Life Impacts

Improvement in quality of life compared to the operational phase

The quality of life that would be experienced in the decommissioning phase would be elevated compared to the operational phase- the cumulative significance ratings of Specialist Report A, C, D, F, G manifest as such for the social impact.

Receptor/ Resource	Process/ Activity	Social Impact	Impact effect	Magnitude (M)	Duration (D)	Scale(S)	Probability (P)	Significance	
								Rating	Value
Social area of influence (Mr. Vogel and farmworkers)	Decommissioning of mine	Improvement in quality of life compared to the operational phase	Positive	6 [2]	5 [4]	2 [2]	3 [3]	Medium [Low]	39 [24]

Mitigation and Management

- Monitoring recommendations as in the Special Reports A-G.

Land Use Impacts

Impact on land use of Mr. Vogel's land

The result of Specialist Report E on soil and land capability suggests a high significance rating. This means that although the quality of life may be slightly elevated compared to the operational phase, that there are residual impacts that would still affect the initial livelihood of Mr. Vogel and one that could not be the same as prior to mining. The land would remain a significantly decreased size to the initial farm with the TSF and WRD that would take up portions of the land.

Receptor/ Resource	Process/ Activity	Social Impact	Impact effect	Magnitude (M)	Duration (D)	Scale(S)	Probability (P)	Significance	
								Rating	Value
Social area of influence (Mr. Vogel and farmworkers)	Decommissioning of mine	Impact on land use of Mr. Vogel's land	Negative	10 [10]	5 [5]	2 [2]	5 [5]	High [High]	85 [85]

Mitigation and Management

- Monitoring recommendations as in the Special Reports A –G.

5.4.2. *Impacts that address scenario (ii): Gold One buys Mr. Vogel's farm and there is physical and economic displacement of Mr. Vogel and farmworkers*

None foreseen.

5.4.3. *General Positive Decommissioning Phase Impacts*

None foreseen.

5.4.4. *General Negative Decommissioning Phase Impacts*

General Community Impacts

Loss of permanent employment opportunities from the mine

The mine would have created permanent employment for approximately 1900 positions in total and when the mine would close, these people would not have their jobs anymore.

Receptor/ Resource	Process/ Activity	Social Impact	Impact effect	Magnitude (M)	Duration (D)	Scale(S)	Probability (P)	Significance	
								Rating	Value
Social area of influence (Phomolong, Whites, Ventersburg, Henneman)	Closing of the mine	Loss of permanent employment opportunities from the mine	Negative	10 [10]	5 [4]	2 [2]	5 [4]	High [High]	85 [72]

Mitigation and Management

- SLP allows for the education and upskilling of mine employees.

5.5. Post Closure Phase

The outcomes of other specialist reports that are needed for considering in the quantifying of the social impacts are as follows:

- The state of **air quality** has a **low** significance rating with mitigation according to *Specialist Report A*. It also conveys the following information:
- The TSF fallout is predicted to be below the residential limit for all the core directly and indirectly affected stakeholders in Figure 31 at the beginning of the section with mitigation;
- However, if rehabilitation is not effective wind erosion on the TSF would be the greatest contributor to degradation of the air quality, which would then manifest as a **medium** significance.

- *Specialist Report C* on **traffic** suggests a **no** significance rating as with no impacts;

- *Specialist Report D* on **visual aesthetics** suggests a **high** significance rating with mitigation.

- *Specialist Report E* on **soil and land capability** suggests a **low** significance rating with mitigation. It is important to consider that soil and wind erosion is expected. The Tailings Storage Facility (TSF) area, Waste Rock Dump (WRD) area and shaft area is also an area where its location will not be able to be used for agriculture or livestock farming, which has a **high** significance rating.

- *Specialist Report G* on **TSF stability** has a **low** significance rating with mitigation as the contents in the TSF dries over time which reduces risk.

5.5.1. Positive Post Closure Impacts

Community Impacts

Community projects that could allow for transition into other skills in the area

The set-up of the mine plays a very important role from the onset and it is intended to advise that community projects occur during the life cycle of the mine such that they are effectively functional by the time the mine closes and it is in its post closure phase. This would allow for an effective transition of the jobs that the mine provided into other professions or skills and means that there would be a positive legacy left behind of the mine. It also means that there is less likely to be a depression in the area due to the closure of the mine, because there would be other initiatives available to the community members.

Receptor/ Resource	Process/ Activity	Social Impact	Impact effect	Magnitude (M)	Duration (D)	Scale(S)	Probability (P)	Significance	
								Rating	Value
Social area of influence (Phomolong, Whites, Ventersburg, Henneman)	Closing of the mine	Community projects that could allow for transition into other skills in the area.	Positive	10 [10]	5 [5]	2 [2]	3 [4]	Medium [High]	51 [68]

5.5.2. Negative Impacts

Community Impacts

Change in the sense of place

The post closure phase and particularly the removal of the shaft headgear would mean that there would be a change in the sense of place from a visual perspective. However, the permanence of the TSF and WRD as a presence that remains would alter the sense of place on a permanent scale even once the mining operations have ceased. This is indicated in the high significance rating from the Special Report D.

Receptor/ Resource	Process/ Activity	Social Impact	Impact effect	Magnitude (M)	Duration (D)	Scale(S)	Probability (P)	Significance	
								Rating	Value
Social area of influence (Phomolong, Whites, Ventersburg, Henneman)	Closing of the mine	Change in the sense of place	Negative	6 [4]	5 [5]	2 [2]	5 [5]	High [Medium]	65 [55]

Mitigation and Management

Mitigation as suggested in Specialist Report D.

5.6. Summary of impacts

The summary of the impacts according to phase and follow below.

Pre-Construction Phase Impacts:	***Positive impact rating with mitigation:***	***Negative Impact rating with mitigation:***
Raising of expectations of people in surrounding communities and towns	/	Medium
Devaluing of properties surrounding the intended mine	/	Medium
In-migration of people seeking employment	/	High
Unceratinty among farmers	/	Low
Possible economic and physical displacement of directly affected farmer	/	Medium

Construction Phase Impacts:		
Scenario (i):		
Reduced quality of life	/	High
Increased levels of nuisance factors leading to increased stress levels	/	Medium
Livelihood impact due to limited land to farm	/	Medium
Scenario (ii):	/	
Physical displacement of farmer and farmworkers directly affected	/	High
Loss of income of farmer indirectly affected	/	High
Mr. Vogel and farmworkers would no longer be residents outside the mine footprint	High	/
General:		
In-migration of people and workers	/	High
Social implications of a construction camp	/	Low
Pressure on infrastructure from influx and overcrowding	/	High
Possible rise in crime levels	/	Low
Rise of disease in the social area of influence	/	Medium
Change in the sense of place	/	Medium

Operational Phase Impacts:		
Scenario (i):		
Lease income for Mr. Vogel	High	
Possible economic growth of local towns of Hennenman and Ventersburg	Medium	
Posisble growth of business and entrepreneurial ventures	Medium	
Employment opportunities	High	
Possible alleviation of poverty levels	High	
Possible transformation of culture of youth	High	
Decrease in quality of life of stakeholders surrounding the footprint of mine	/	High
Impact on health of stakeholders surrounding the footprint of mine	/	Medium
Change in cultural landscape	/	High
Scenario (ii):		
No associated impacts.	/	/
General:		
Possibility of illegal mining attracted by mining activity	/	Low
Possible increase in criminal activity	/	Low
Impact on health of surrounding communities	/	Low

Decomissioning Phase Impacts:		
Scenario (i):		
Improvement in the quality of life compared to the operational phase	/	Low
Impact on land use of Mr. Vogel's land	/	High
Scenario (ii):		
No associated impacts	/	/
General:		
Loss of permanent employment opportunities from the mine	/	High
Post Closure Phase Impacts:		
General :		
Community projects that could allow for transition into other skills in the area	High	/
Change in the sense of place	/	Medium

6. SOCIO-ECONOMIC CASE STUDY LESSONS FROM THE BEATRIX MODEL IN THE FREE STATE PROVINCE, SOUTH AFRICA

Beatrix is an operational gold mine approximately 20 km west of the planned Ventersburg project. It was used as a case study for the proposed project to identify key lessons which may be applicable to the proposed project.

The lessons that were most valuable to the scenario of the Ventersburg Mine are listed below and will be addressed separately. They include:

- The benefits of an effective transport system to a social environment;
- An example of the co-existence of mining and agriculture in a similar environment.

6.1. Setting the scene of Beatrix Mine

Beatrix is a gold mine that is situated outside the towns of Welkom and Virginia, which has an estimated labour force of 8000 people and it is in its operational phase of mining.

There is no mining village or separate housing establishments that have been especially created for mine employees. There are two historical single sex hostels which are used by employees who choose to live in them. There are different levels of earners and some of the levels are given a housing allowance for accommodation purposes of their choice.

The advantage of this system is that the individuals and families can be accommodated within their preferred social system. The disadvantage of such a system is that housing allowances are sometimes used for other purposes. The system works for the Beautrix Mine due to an effective transport system and network.

6.2. The transport network system of Beatrix

The Beatrix bus transport system has numerous bus stop pick up points that are relevant to the labour force. The system that accommodates the respective shifts of the mine and provides frequent and reliable transport for employees of the mine. The transport system and network is outsourced by the mine to a reliable bus company, which also brings employment to the surrounding communities and local setting.

Figure 32: Bus transport system of Beatrix Mine.

This model poses as an opportunity for the minimizing of negative impacts associated with the Construction Phase of a mine. This means the consideration of such a transport system would assist in the housing of construction workers off the project site and in nearby towns if necessary. It could assist in the prevention of additional in-migration of job-seekers during the construction phase.

6.3. Co-existence of Mining and Agriculture in the surrounds

Beatrix and the proposed Ventersburg Mine (once operational) would be similar in that they are both gold mines located within an agricultural setting. The images below indicated that this relationship or coexistence is possible.

Figure 33: Quality of crop outside Beatrix Mine

Figure 34: Crops in close proximity to one of Beatrix Mines.

The image above, Figure 34, indicates an agricultural enterprise that is located around 200 m from the shaft headgear and where both the mining and the agriculture are functional.

The following section will address the range of impacts that would be anticipated in the case of the Ventersburg Mine.

7. SOCIO-ECONOMIC MANAGEMENT AND MONITORING PLAN

The fundamental purpose of the Social Economic Management and Monitoring Plan (SEMMP) is to put forward ways of diminishing the negative impacts and enhance and elevate the positive impacts of the proposed project. Some of these methods include proactive programs that can be done before the impacts arise, which can be the most effective form of mitigation. This is based on the principle of "Doing things right the first time around," where the importance of this principle in the social realm cannot be underestimated.

Programs are therefore directed toward the impacts that indicated the highest significance ratings in the social realm.

7.1. Programs

7.1.1. Stakeholder Engagement Plan (SEP)

Interaction and informing the respective stakeholders and members of the community is a vital and important step in any development endeavor. It forms the basis of the nature of the interactions between the mine in this case and the respective people in the community and therefore sets the tone for engagement between all the respective parties. It is therefore imperative that it is as positive as possible given the sometimes-difficult interactive components, which form a part of project. This means engagement throughout the project stages from pre-construction through to closure. It is on this basis that an intentional SEP be compiled and that a part of this process includes the setting up of a grievance mechanism that can be accessible to the respective parties involved.

The SEP serves the many purposes which are listed below:

- It clarifies the I&AP and community members involved;
- It explains the nature and extent of all the intended endeavours as a part of the mining project;
- It allows for the presentation of issues or problems from the community perspective as well as its resolution;
- It provides constant communication on the mining project which is needed information to stakeholders.

7.1.2. The Sustainable Growth Committee Program

The Ventersburg, Hennenman, Whites and Phomolong Sustainable Growth Committee Program is one that focusses firstly on the formation of the VHWP Sustainable Growth Committee with the representation from the mine, government and community leaders that form a part of it. It would need to be governed by its own constitution which allows it to be consultative in nature. The ultimate purpose of this committee is to be the custodians of the data that is monitored as well as be a part of the process of participatory monitoring. It is also to ensure that the growth of the area is that which is in line with the concept of sustainability as proposed by the Brudtland Commission,

which is “to meet the needs of the present without compromising the ability of future generations to meet their own needs.” The program would entail quarterly meetings to discuss key issues and successes that have been raised in the data collected or interpreted through the respective monitoring programs and mitigation measures.

7.1.3. Construction Phase Mitigation Program

In Section 6 addressing the impacts of the proposed gold mine and its summary, it became apparent that there are negative impacts that are associated with the construction phase of the mine. Most of these impacts would have the most dominant effects on Phomolong as the receptor community which is an estimated 2 km to the site of the mine.

As suggested in the mitigation measures and the case study section of Beatrix, there is a way that the construction phase can be structured such that the negative social ills and impacts, do not manifest in the receptor community of Phomolong on such a scale that it changes the fabric of the community.

This is based on the concept that there should not be a construction camp in the surrounds of Phomolong, but rather the use of existing facilities in the Virginia or Welkom towns where impacts can be absorbed into a larger environment. Thus, the workforce of the construction phase can be bussed in and bussed out of the site area for working hours.

On a practical level, there is infrastructure for housing for mine employees that was built by Harmony in Virginia in the past and it is likely that it would be available for use at a reasonable cost given that a lot of the mines are closing.

This would mean that the following would need to be set up as a part of this program in the Planning Phase of the mine for the Construction Phase:

- Contracts to rent out housing in Virginia;
- The agreement on a central pick up point in Virginia where workers would be able to meet at a certain time every day to be bussed in the site;
- Agreement of a central pick up point where workers would be collected at the site;
- Selection and contract with a bus company that would be able to provide the bus service that the mine could outsource the “bus in bus out” system to manage.
- It would be imperative that the Phomolong Community be briefed according to the new movement of people and that some of the labour force for the Construction Phase be sourced from Phomolong and the surrounding communities such that there is not unrest regarding the bussing in and bussing out of workers.

The design of this system is one that could be easily managed when the bus system is outsourced and housing is provided in already existing infrastructure where the management of a construction camp would not be needed. It allows for the independence of the contract workers as well as no further pressure on infrastructure on Phomolong and the social environment.

The progress and effectiveness of this system would need to be monitored weekly for the first three weeks such that if issues arise that adaptive management and fast resolve of the issues can take place. And after that monthly by means of brief random interviews of the construction workers and respective management. This would be monitored at the two points of departure of the "bus in bus out" system. This could be carried out by the ECO.

This is not a compulsory mitigation measure but rather one that needs extensive consideration in the minimizing of the effects of the construction camp which would be an estimated 250 people. This decision could be the first consultative discussion had by the VHWP Sustainable Growth Committee.

7.1.4. Community Development Program (CDP)

It would be beneficial for the CDP to be formed by the MLM where a process is undertaken where the respective communities form a part of this process of identification of what community development the people would like to see in the area. This has the advantage of then having "buy-in" from the local communities in the MLM and an identification with the projects that would be intended for the area in the future. It would also assist the community members to feel a level of ownership in the projects participation and protection, as they formed a part of a process to identify its need.

Interviews undertaken revealed the following needs which could be taken into consideration for community development:

- Clinics in both Phomolong and Whites communities;
- Another Police Station in Phomolong;
- Processes that allow for local community members to be employed as far as possible if the mine is opened;
- A technical program at High Schools in Phomolong;
- Better infrastructure for schooling in Whites.

7.1.5. Social Labour Plan (SLP)

A SLP is intended to encourage the formation of jobs for the local setting and growth in social and economic realms for South African citizens. For the opening of a new mine it would imperative that the Mining Charter and all its associated pillars be consulted with in the preparation of the document.

7.1.6. Community Monitoring Program

Monitoring the changes at the communities and associated sites of the communities becomes very important with an endeavour such a gold mine which may have large socio-economic implications. These communities are the Phomolong Township Community; Ventersburg Community; Hennenman

Community and Whites Community respective that have been identified as the stakeholders that feature in the vicinity and are therefore feature as receptor communities.

A good foundation of a community monitoring program is when participatory monitoring can take place. This means that there are people in the respective communities that play a voluntary role in monitoring of respective impacts. The feedback of the monitoring could be directed toward the VHWP Sustainable Growth Committee.

A core impact that was rated with a high significance rating is that of In-migration of people and workers. Therefore, an imperative monitoring program is as follows.

7.1.6.1. In-Migration Management Plan

An In-Migration Plan should be compiled as a separate document in collaboration with a variety of stakeholders such as leadership of the mine, leadership of MLM and LDM as well as community leaders of Phomolong, Whites, Hennenman and Ventersburg. The platform which could be used for this is a meeting of the VHWP Sustainable Growth Committee. The purpose of such a document is to define the roles and responsibilities and actions expected from the different stakeholders in the management of the impact of In-Migration. It is also to brainstorm ways that are practical to the local setting, that would mitigate and manage the negative effect of this impact, such that it cannot extensively affect the communities negatively. It would beneficial if a census of Phomolong informal extension is done such that there is a baseline of that environment which is created.

7.1.6.2. Socio-Economic Monitoring of Immediate Receptors Surrounding the mine Footprint

There are four core receptor stakeholders that would need to be monitored throughout the LOM, they are:

- Impacts at Mr. Vogels dwelling;
- Impacts at farmworkers dwellings;
- Impacts at Mr. Coetzer;
- Impacts at Phomolong (formal and informal sections).

As indicated in the impact section, where two scenarios (i) and (ii) were explored, and the respective monitoring implications would depend one which outcome is chosen by the decision makers of Gold One as well as the directly affected farmer.

The monitoring of the impacts would mean the implementation of the monitoring of the *Specialist Reports A-G* that were referred to in this SEIA, as the management of those factors plays a role in the functioning of the social environment.

Having taken into account some of the mitigation measures in the other special reports, it was seen as imperative, that the following be implemented.

"Social buffer" creation and implementation

A buffer zone is usually an area of land that is created as a means to separate areas and is used in many industries.
What is meant by a "social buffer" in this case is a boundary that is created for protecting of the people and animals in the surrounds of the footprint of the mine in a physical and cultural way.

This means that there would be a physical boundary such as a secondary fence that would occur at least 500m from the position of the shaft and act as a boundary before the boundary of the footprint of the mine. This would act as a deterrent for people to cross this boundary. In some cases, in the mining industry in South Africa, ostriches have been placed between the outer boundary fence and another fence such to create a long enclosure for the ostriches that prohibit people from cutting the fences as they fear the ostriches, therefore forming another level of a barrier before entering the boundary of the mine. This would form a part of what is meant by the physical barrier.

The cultural barrier would be the awareness that is created of mining and the safety of staying out of the buffer zone. This would be created by:

- Workshops that educate the stakeholders of Mr. Vogel, the farmworkers and their families, Mr. Coetzer and his employees, as well as at the schools in Phomolong as the main receptor community members regarding safety issues of the mine and the hazards that they would need to know of from a social perspective in the different stages.

The following measures in the table below would also be beneficial.

Community area:	Theme:	Monitoring Action:	Timeframe:	Associated Phase:
Phomolong	Culture	Feedback focus group with Police of Phomolong Satellite Station for issues of crime or its reduction and how social issues are changing or resolving during the life cycle of the mine.	Quarterly	Construction, Operation, Decommissioning.
	Culture	A focus group with the all of the Principals in Phomolong could monitor and give feedback to the way the culture of the youth is changing in Phomolong. Key issues sent for discussion to the Sustainable Growth Committee (SGC).	Annually	Construction, Operation, Decommissioning
	Culture	Awareness in a large rise in population, which would be visually evident by the growth of the informal component of Phomolong. This could be monitored by the Ward Councilor and feedback given to the SGC.	Monthly	Construction, Operation.
	Heath	Key changes in prevalence of diseases such as HIV/AIDS or TB or RTI could be communicated by the Phomolong Clinic manager to the Ward Councillor and feedback given to the Sustainable Growth Committee for adaptive management discussion.	Monthly	Construction, Operation.
Surrounding	Community	Feedback about the adaption of the farmers to the	Monthly	Construction,

Farmers of Ventersburg and Hennenman		mine could be conducted at the Farming Associations meetings and conveyed to the Sustainable Growth Committee.		Operation.

8. CONCLUSION

The Baseline Information section of the report served the purpose of providing data that is relevant to the monitoring of the impacts identified. It indicated the current information related to the LDM and the MLM as well information pertaining to the understanding of the local environments and stakeholders of Ventersburg, Phomolong, Hennenman and Whites as the key localities in question.

The respective data collected was related to the following indicators:

- Population and population growth rates;
- Population distribution;
- Accessibility to services (such as water, sanitation, electricity, refuse removal);
- Education;
- Unemployment and Youth Unemployment;
- Core industries.

The area which displayed the most sensitivity as a receptor was Mr. Vogel's dwelling, Mr. Coetzer's dwelling and the dwellings of the farmworkers that live on Mr. Vogel's property. This is largely due to their proximity to the mine footprint.

For clarity purposes and for the full understanding of impacts, a scenario approach was used to assist with decision-making, where scenario (i) represented Mr. Vogel and the farmworkers remaining in the current dwellings; and where scenario (ii) represented Mr. Vogel and farmworkers vacating their dwellings and property.

The core positive impacts of the intended project are:

- Employment opportunities (indirect impact) ;
- Possible alleviation of poverty levels (indirect impact);
- Possible transformation of culture of youth (indirect impact);
- Community projects that could allow for transition into other skills in the area (cumulative impact).

The core negative impacts of the intended project are:

- Devaluing of properties surrounding the intended mine (direct impact);
- Reduced quality of life (for stakeholders in scenario (i)) (direct impact);
- Physical displacement of farmer and farmworkers directly affected (for stakeholders in scenario (ii)) (direct impact);
- In-migration of people and workers (indirect impact);
- Pressure on infrastructure from influx and overcrowding (cumulative impact);
- Decrease in quality of life of stakeholders surrounding the footprint of mine (direct impact);
- Impact on land use of Mr. Vogel's land (for stakeholders in scenario (ii)) (direct impact).

It is evident that there are clear positive impacts that can benefit the communities such as Phomolong, Hennenman and Ventersburg by the commencement of this project. However, it is also clear that there are negative impacts that would need to be addressed.

Out of the significance ratings that impact on Mr. Vogel and the farmworkers that reside on this property, the high significance rating that would take place on these stakeholders in especially in the construction and operational phases cannot be ignored. There are impacts related to these stakeholders that are apparent in all of the quality of life, health, community and land use domains. This would be related to **scenario (i).** It would be imperative that if this option is chosen in decision-making by Mr. Vogel and Gold One, that it be effectively managed and monitored as with mitigation measures from all of the reports. It would also be imperative that Mr. Vogel be aware of the permanent impacts that would affect him in the long term as well as that there are clear expectations of the effect that post-closure of the mine will not mean the return of the environment to the conditions as they were before mining. It would imperative that the investigation into a new model of farming would be done such that a clear understanding is present of its viability.

S**cenario (ii)** would be beneficial for Gold One is because it allows land to be used as what was described as a "social buffer" (a physical boundary at least 500 m from the shaft that would allow for the protection of adults, children and animals from the site) for the surrounding community of Phomolong. It also prohibits the risk of incidents and reputational damage of the mine if there was to be an incident of a harmful nature that occurred to some of the estimated 35 adults and children who would be living immediately outside the footprint of the mine. This option would be beneficial for Mr. Vogel and the farmworkers who reside on his property as it would allow them not to experience the social impacts identified.

It is however the decision of the stakeholders in question to reach an agreement. One of the purposes of this report was to put forward the respective impacts associated with each scenario such that there can be an informed decision.

The SEMMP includes programs that would assist in the management and monitoring of the negative and positive impacts associated with the project have been explained and are identified as follows:

- SEP;
- Sustainable Growth Committee Program;
- Construction Phase Mitigation Program;
- CDP;
- SLP;
- Community Monitoring Program;
- Socio-Economic Monitoring of Immediate Receptors Surrounding the mine Footprint.

It is recommended that these programs be followed in addition to the mitigation measures as a part of the management of the anticipated socio-economic impacts of the proposed Ventersburg Project.

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APPENDICES A

C E Turner CV

EDUCATIONAL BACKGROUND

2017, 2016.	**University of Pretoria. Masters in Historical and Cultural Science with specialisation in Heritage and Cultural Tourism [Current: part time]**
2016	First Aid certificate (Level one renewed)
2014	**University of Pretoria. Short Course in Business Process Management**
2013	First Aid certificate (Level one renewed)
2011	**University of Pretoria. Bachelor of Historical and Cultural Science with specialisation in Heritage and Cultural Tourism Honours (with distinction).**
2010	University of Pretoria. Bachelor of Historical and Cultural Science with specialisation in Heritage and Cultural Tourism. University of Pretoria. Basic Tourist Guide Accreditation certificate. University of Pretoria. Gauteng Tourist Guide Accreditation certificate. First Aid certificate. (Level one)
2007	New Horizons- Johannesburg. Microsoft Excel 2003 certificates. (Levels 1, 2, 3.)
2006	University of Cape Town. Bachelor of Science with specialisation in Speech Language Pathology and Audiology. Completion of first year.
2004	Parktown High School for Girls. Matriculation: pass with merit.

WORK EXPERIENCE

From 2013 September	Director. Turnscapes Travel and Tourism Pty Ltd. Social and Tourism Impact Assessment Specialist. (Current). The role of the director encompasses a range of responsibilities associated with the effective running of the business that include strategic planning, marketing, design and implementation of respective products and services as key elements in this regard. It also includes the carrying out of Social Impact Assessments and Tourism Impact Assessments as a part of the core consulting component of the business. *Social Impact Assessment Projects:* Eskom Nzhelele (RSA) –Triangle (Zim) Corridors Project (2016)

	Eskom North-East Waterlogged Towers Project (2015) Gibb Soshanguve Precinct Mixed Housing Development Project (2014) Eskom Ngwedi Project Rustenburg (2015) Eskom Bloemfontein Strengthening phase 2 Project (2016) Eskom Randfontein Northern Strategic Project (2016) Eskom Tartlon Power-line Project. (2016) Eskom West Gauteng Strategic Servitudes Project 11. (2016) *Tourism Assessment Projects:* Eskom Nzhlele(RSA) –Triangle (Zim) Corridors Project (2016) Eskom Bloemfontein Strengthening phase 2 Project (2016)
2013 (April- 30 June)	Lecturer. University of Pretoria Third year students in Heritage and Cultural Tourism were taught. The skills developed were in public speaking, marking, analytical thinking as well as coordinating with professors. *Reason for leaving*: End of contract.
2012 (August – 2013 July)	Research and financial assistant. University of Pretoria The role undertaken involved assisting with the research for the report of cross border guiding in Southern Africa for the National Department of Tourism, as well as the financial recording for the project. *Reason for leaving*: End of contract.
2012 (February – July)	Consultant. Transboundary Consulting Africa My role was the sourcing of GIS data and research for phase one of the Ecosystem Services Based Land Use Decision Making Model for the Department of Environmental Affairs. My role in the project for the African World Heritage Fund was mainly research and communication contributing to the topic of World Heritage Sites and Extraction in Africa: The Role of Local Communities. *Reason for leaving*: To pursue a different direction.
2011 (February – November)	Tourist Guide. University of Pretoria Campus Tours My role was the recording of transactions for the business and being a tourist guide for influential guests of the University as well as for prospective students. *Reason for leaving*: End of university year. The Tuks board game I was largely involved in the conceptualizing of the first global University board game to date.
2009-2011 (April 2009 – January 2011)	Accounts Manager.Copperstone Promotions. I often worked in partnership with the director to ensure events were planned and run properly. My main contribution to the company was sponsorships attained for events and the building of positive relationship with customers. *Reason for leaving:* To focus on honours degree.

2009-2010 (October 2009 - November 2010)	Project manager. The Stress Box. I was responsible for the managing of the project, ensuring that the product of The Stress Box was made in the best way possible. I often gave critical feedback on the product, sourced the respective products within the box and liaised with the respective companies involved. I was also largely involved in the launching of The Stress Box. *Reason for leaving:* To focus on honours degree.
2009 (April –May)	Researcher. Leadership for Conservation in Africa. Tourism feasibility study in Cape Three Points, Ghana. My role was to contribute to the feasibility study by assessments and visiting all the respective sites in Ghana, and clarify whether tourism would prosper there by means of a feasibility study document. *Reason for leaving:* Completion of task of feasibility study.
2007 (June- July) (September-December)	Assessor. Goldfields. Driefontein Occupational Health centre. My role was to assess the competency of workers who were being considered to work underground on the Driefontein mines by doing occupational health assessments. Au Pair I was responsible for picking children up from school and assisting them with homework and test preparation. *Reason for leaving:* To pursue a degree at the University of Pretoria.
2006 (June-July)	Audiology elective observations. Leslie Williams Hospital, It was exposure to the practical side of Audiology that included general consultations, programming and fitting hearing aids as well as hearing tests.

SPECIAL AWARDS

2012	University of Pretoria. Academic Honourary Colours. University of Pretoria. Golden Key International Society. MACE Award for the Tuks Board Game. Campaign category.
2004	Summited Mount Kilimanjaro. Machame route. Parktown High School for Girls- Representative Council of Learners award for leadership.

CONFERENCES

2012	African World Heritage Fund Conference
2013	National Department of Tourism Research Conference
2015	International Association of Impact Assessment Annual Conference

REFERENCES

Available on request.

DETAILS OF SPECIALIST AND DECLARATION OF INTEREST

The specialist appointed in terms of the Regulations_ National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended and the Environmental Impact Assessment Regulations, 2014;

I, CHANEL EMILY TURNER , declare that -

- General declaration:

I act as the independent specialist in this application;
I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
I declare that there are no circumstances that may compromise my objectivity in performing such work;
I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
I will comply with the Act, Regulations and all other applicable legislation;
I have no, and will not engage in, conflicting interests in the undertaking of the activity;
I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
all the particulars furnished by me in this form are true and correct; and
I realize that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.

Signature of the specialist:

TURNSCAPES TRAVEL AND TOURISM

Name of company (if applicable):

16 · 02 · 2017 ·

Date: