

Appendix D14  
Proposed Kareerand Tailings Storage Facility (TSF) Expansion  
Project, Near Stilfontein, North West Province  
Socio-Economic Impact Assessment Report  
- Batho Earth & SED, 2020



**PROPOSED KAREERAND TAILINGS STORAGE FACILITY (TSF)  
EXPANSION PROJECT, NEAR STILFONTEIN, NORTH WEST PROVINCE**

**GCS REFERENCE NO: 17-0026**

**SOCIO-ECONOMIC IMPACT ASSESSMENT REPORT: DRAFT**

**Submitted to:**

GCS (Pty) Ltd.

**Submitted by:**



AND



**August 2020**

## **EXECUTIVE SUMMARY**

### **Project Background**

The operations of Mine Waste Solutions (MWS), also known as Chemwes (Pty) Ltd (Chemwes), entail the collection and reprocessing of mine tailings that were previously deposited on tailings storage facilities (TSFs) in order to extract gold and uranium. MWS conducts its operations over a large area of land to the east of Klerksdorp, within the area of jurisdiction of the City of Matlosana and JB Marks Local Municipalities, which fall within the Dr Kenneth Kaunda District Municipality in the North-West Province. The main operations of MWS include the existing Kareerand Tailings Facility (TSF) located to the south of the N12. The closest town is Khuma, located about 2km northwest of the facility, and other nearby towns include Stilfontein (10 km from facility) and Klerksdorp (19 km from facility).

The Kareerand TSF was designed with an operating life of 14 years, taking the facility to 2025, and total design capacity of 352 million tonnes. Subsequent to commissioning of the TSF, MWS was acquired by AngloGold Ashanti (AGA) and the tailings production target has increased by an additional 485 million tonnes, which will require operations to continue until 2042. The additional tailings therefore require extension of the design life of the TSF.

The expansion of the existing TSF will enable the reclamation of additional tailings dams and deposition of the tailings in an expanded facility complete with a geofabric liner and appropriate seepage mitigation measures. The project will aim to support concurrent rehabilitation of the existing TSF and the expansion TSF.

The TSF expansion is proposed on the western edge of the current facility, and the final height of the combined facility (both expansion and current) will be 122m. The expansion footprint will add about 380 hectares (ha) to the existing TSF. The pipeline network will be expanded to link the Buffelsfontein TSFs to the East Pump Station as well as the outlying TSFs to the west, and north of Orkney. A new slurry trench and two new slurry launders will be developed at the Buffelsfontein, Hartebeesfontein and Mine Waste Solution TSFs respectively. Three new pump stations and two new satellite pump stations will also be added to the footprint of the operation. Two of the main pump stations will be located at the outlying TSFs near Orkney, while the last one will be located at the MWS TSF complex. The two satellite pump stations will be developed at the Buffelsfontein and outlying TSFs respectively.

### **SEIA Methodology**

The Socio-Economic Impact Assessment (SEIA) is undertaken in line with the guidelines from the National Environmental Management Act (NEMA), Environmental Impact Assessment Regulations. The SEIA of the Kareerand Tailings Expansion Project will include the following deliverables:

- A socio-economic baseline description of the local area surrounding the project area;
- Description of the life-cycle socio-economic impacts of the project including the construction, operational, decommissioning and post-closure phases; and
- Propose mitigation and management measures to enhance positive social benefits and reduce negative impacts on the local socio-economic environment.

The SEIA research and findings are based on primary sources, secondary sources and economic modeling.

### **Socio-Economic Baseline**

The project is located in the Dr Kenneth Kaunda District Municipality within the North West Province. The Kareerand Tailings Storage Facility (TSF) falls within Ward 2 of the JB Marks Local Municipality (JB Marks LM). The proposed pipeline extensions to the south west of Kareerand TSF however fall in the area of the City of Matlosana Local Municipality (CMLM) and include the rural areas of Ward 34 directly west of the TSF; Ward 33 of the CMLM (including Buffelsfontein and Hartbeesfontein), as well as the southern areas of Ward 21 (including Vaal Reefs mine) and Ward 29 both close to the town of Orkney.

The following community receptors in the area were identified:

- The closest settlement to the facility is Khuma (approximately 2 km north-west on the opposite side of the R502);
- Stilfontein, about 10 km to the north-west, also on the opposite side of the R502;
- Klerksdorp is 22 km to north-west of the Kareerand TSF;
- A number of farms with irrigated farming to the north east and east of the site as well as south of the westward flowing Vaal River. There are some 20 small holdings (1-5 hectares) to the east of Wawiel Park Holiday Resort;
- Limited irrigated farming activities on the northern banks of the Vaal River some 7 km south west of Kareerand TSF
- Tim's Haven, a small riverfront residential development village (with permanent and temporary residents) consisting of between 20-30 houses on the northern (North West) banks of the Vaal River some 2.5 km north-east of Kareerand TSF;
- Wawiel Park Holiday Resort and Clementia Wedding and Conference Centre on the southern banks of the Vaal River (6km south west of the Kareerand TSF)
- Renovaal (Free State), a holiday and residential town across the Vaal River, about 9 km south east from the site.
- Chubby Chick chicken farm about 7km north east from Kareerand TSF; and
- The Margaret Community located between Stilfontein and the RDP housing extensions of Khuma (Extensions 6, 8, 9 and 10).

Land-uses in the area include residential areas, smallholdings, existing and historical mining and related activities, informal cattle farming and/or subsistence cattle grazing, crop irrigation, and game farming. The larger study area also forms part of the N12 treasure route.

The JB Marks LM's population was at 243 527 individuals in 2016 with an average of 38 people per km<sup>2</sup>. Population and household growth in the CMLM have slightly increased between 2011 and 2016 but showed a slower increase at 0.35% in 2016. In 2011 the Khuma town's population totalled 45 895 individuals and 14 154 households which totals approximately 11% of the total municipal population. A relatively high percentage of the population falls in the working age category. This is especially the case in Stilfontein, the rural JB Marks ward close to the Kareerand TSF and the CMLM rural wards south west of the TSF. The high percentage of economically active population combined with the high percentage males in these areas suggests high levels of in-migration

(current/historic) to these areas. In comparison, the relatively low male ratio in Khuma could suggest some out-migration from the township area.

The rural JB Marks ward close to Kareerand TSF shows relatively low skill levels. Within CMLM, Stilfontein and the rural wards south west to Kareerand TSF higher skill levels are present compared to the municipal average while skill levels in Khuma are on average lower.

Within the Dr Kenneth Kaunda District, the CMLM makes the largest contribution towards the district's economy, even though the local economy of the CMLM experienced a decline of close to 2% per annum from 2010. Despite the slow-down in mining activities in the CMLM, the mining sector still makes a significant contribution towards economic output, the second largest contribution after the services sector (mainly public sector services). The trade sector also plays an increasing role in the local economy.

While the manufacturing sector of JB Marks Local Municipality is smaller than the sector in the CMLM, the sector plays a relatively larger role in the local economy compared to its role in the CMLM economy. The services industry also plays a major role in the JB Marks economy due to the presence of the North West University in Potchefstroom.

The CMLM shows higher unemployment rates compared to JB Marks LM. Ward 2 of JB Marks LM, where the project is located, furthermore shows lower unemployment rates than unemployment rates in the greater JB Marks LM and much lower rates than in the CMLM. High unemployment rates in Khuma and the Margaret community, however prevail. It should also be noted that the youth unemployment rate is on average much higher than the general unemployment rate.

Poverty rates are similar in the CMLM and JB Marks LM and compared to the national average poverty rate in 2011. With the dismal performance of the local economies since 2011, the poverty rates of both municipalities are currently more likely closer to the higher provincial poverty rate. Again, high poverty rates are prevalent in Khuma and the Margaret Community.

Both the CMLM and the JB Marks LM face challenges in terms of a relatively high portion of households living in informal houses, (albeit in fewer settlements); municipal financial management, relatively high portion of mines operational in the municipal areas and specifically high levels of municipal vacancies and low skill levels of municipal staff. Of particular concern are challenges related to wastewater treatment in CMLM that, together with the high level of mining activities in the local area, has negative implications for the high levels of pollution already present in the Vaal River system.

The focus areas of the JB Marks LM Spatial Development Framework include the provision, maintenance and upgrading of infrastructure, priority projects along N12 Corridor, eco-tourism activities, revitalization of the CBD in Potchefstroom and Ventersdorp, as well as the promotion of accessibility of communities to employment, recreation and social opportunities.

The CMLM Integrated Development Strategy focuses on the regeneration of the manufacturing sector, growth of tourism and the linkages to the sector, growth of agriculture, the development and growth of the information technology sector, re-skilling of the labour force, the regeneration of industrial areas and CBD's and upgrade of residential areas, the utilization of co-operatives in the municipality's procurement system and facilitation of the growth and contribution of SMME's.

## **Main Findings**

There are significant positive impacts associated with the proposed project, such as the continuation of employment and income generation, impact on poverty reduction, impact on tax revenue and social investment in communities, as well as stimulation of economic growth. Another positive impact is the reclamation of scattered tailings facilities throughout the area that could act as possible pollution sources.

There are however several potential negative socio-economic impacts of the proposed project that may affect surrounding landowners and residential areas. These negative impacts associated with the proposed project include the external costs, impact on sense of place, increased nuisance factors (dust levels, noise and traffic movement), and community safety impacts (health risks and concerns, general community safety due to illegal mining activities and increased crime, possible structural failure of the proposed TSF and possible negative impacts on environmental and water resources).

The socio-economic impacts that are rated as medium remains at a medium rating, after mitigation or enhancement measures have been applied. There are some socio-economic impacts that are rated as high as the TSF remains a considerable risk due to the environmental impacts associated with such a facility, the size of the structure and the always present risk of failure. These risks, however, can be mitigated to a medium rating, but is mainly dependent on appropriate and successful environmental management of the tailings facility, as well as the strict implementation of pro-active mitigation and management measures.

## **Conclusion**

The project is anticipated to facilitate the continuation of high economic benefits to the local area, currently faced with high rates of unemployment and poverty. Based on the historical performance of the project in terms of environmental impacts there are however concerns related to the institutional capacity of both MWS and public institutions to monitor and manage project-related environmental externalities that could compromise the long term growth of the local area.

Based on the institutional concerns related to the monitoring and management of project-related impacts the residual environmental costs to the local communities close to the expanded Kareerand TSF could be high. To lower the risks (as well as uncertainties around these risks) and improve the project's 'social license to operate' in the local area the following is recommended:

- The knowledge gaps related to the project should be addressed. These include:
  - The unknown impact on soil and water quality in the case of potential spillages along the new or existing pipelines (the specialist studies focused on the TSF area and not the supporting infrastructure);
  - The status and impacts of the rehabilitation of the historical TSFs are unknown;
- Expand the current community forum into an Environmental Management Working Group that incorporates an external ombudsman function to monitor compliance and provide advice on the implementation of the Environmental Management Plan (EMP). It is recommended that such a working group could consist of an independent representative NGO with capacity and that has experience and trust in the local area, local community representatives from Khuma, Stilfontein and surrounding farms (not benefiting or seeking gain from the project through employment or

procurement), representatives from JB Marks and CLML and representatives from the DMR, DEA and DWS;

- The existing Emergency Management Plan should be reviewed and amended to include the proposed project. It would be important to review the functionality and efficiency of such a plan in conjunction with the local emergency teams, MWS management and affected communities as well as neighbouring landowners.

## **GLOSSARY OF ABBREVIATIONS**

AGA:	Anglo Gold Ashanti
CMLM:	City of Matlosana Local Municipality
CV's:	Curriculum Vitae
DAFF:	Department of Agriculture, Forestry and Fisheries
DEA:	Department of Environmental Affairs
DMRE:	Department of Mineral Resources and Energy
DWS:	Department of Water and Sanitation
EAP:	Environmental Assessment Practitioner
EIA:	Environmental Impact Assessment
FSE:	The Federation for a Sustainable Environment
GVA:	Gross Value Added
ha:	hectare
IDP:	Integrated Development Plan
JB Marks LM:	JB Marks Local Municipality
KOSH:	Klerksdorp, Orkney, Stilfontein, Hartebeesfontein
LED:	Local Economic Development
MPRDA:	Minerals and Petroleum Resource Development Act of 2002
MWS:	Mine Waste Solutions
NGO:	Non-Governmental Organisation
SEIA:	Socio-Economic Impact Assessment
SLP:	Social and Labour Plan
TDS:	Total Dissolved Solids
TSF:	Tailings Storage Facility
SDF:	Strategic Development Framework



## TABLE OF CONTENTS

	Page
<b>1. INTRODUCTION.....</b>	<b>13</b>
<b>1.1 Project Background .....</b>	<b>13</b>
<b>2. LEGAL REQUIREMENTS AND GUIDELINES.....</b>	<b>16</b>
<b>2.2 Checklist: Requirements for Specialist Reports, as Contained in the 2014 EIA Regulations .....</b>	<b>17</b>
<b>4. SCOPE OF WORK AND METHODOLOGY.....</b>	<b>19</b>
<b>5. DESCRIPTION OF THE BASELINE ENVIRONMENT.....</b>	<b>19</b>
<b>5.1 Key aspects of the affected municipalities and other stakeholders.....</b>	<b>19</b>
5.1.1 Dr Kenneth Kaunda District Municipality.....	19
5.1.2 JB Marks Local Municipality .....	20
5.1.3 City of Matlosana Local Municipality.....	21
5.1.4 Wards and Settlements in the study area .....	21
5.1.5 Land use .....	22
5.1.6 Sensitive Receptors .....	23
<b>5.2 Demographic Profile .....</b>	<b>24</b>
5.2.1 Population Figures .....	24
5.2.2 Age Structure and Gender.....	25
5.2.3 Education and Skill Levels.....	25
<b>5.3 Socio-Economic Profile .....</b>	<b>26</b>
5.3.1 Structure of Local Economy .....	26
5.3.2 Composition of the labour force.....	28
5.3.3 Household Income Levels and Poverty .....	29
5.3.4 Levels of Economic Inequality in the Local Economy .....	30
5.3.5 Economic diversity .....	30
<b>5.4 Basic Service Delivery .....</b>	<b>31</b>
5.4.1 Town Planning and Housing Provision .....	31
5.4.2 Road Infrastructure.....	31
5.4.3 Electricity Infrastructure.....	32
5.4.4 Health Services and Infrastructure .....	32
5.4.5 Safety and Security .....	32

5.4.6	Water Provision and Sanitation Infrastructure.....	33
5.4.7	Institutional Capacity .....	33
5.5	<b>Development Priorities .....</b>	<b>35</b>
6.	<b>SOCIO-ECONOMIC IMPACT METHODOLOGY .....</b>	<b>38</b>
7.	<b>SOCIO-ECONOMIC IMPACTS DURING CONSTRUCTION .....</b>	<b>40</b>
7.1	Description of the Construction Phase.....	40
7.2	Temporary jobs and income.....	41
7.3	Negative impacts related to project-induced population influx .....	42
7.4	Nuisance factors .....	43
8.	<b>SOCIO-ECONOMIC IMPACTS DURING OPERATIONS .....</b>	<b>47</b>
8.1	Description of the Operational Phase.....	47
8.2	Continuation of job and income opportunities .....	47
8.3	Impact on poverty through employment .....	49
8.4	Continuation of generation of public revenues.....	51
8.5	Increased economic concentration of the local economy.....	52
8.6	Increased resource use .....	53
8.7	Potential loss of income for businesses and households due to externalities ..	54
8.8	Sense of place .....	57
8.9	Nuisance factors .....	60
8.10	Community Safety.....	62
9.	<b>SOCIO-ECONOMIC IMPACTS DURING DECOMMISSIONING AND POST-CLOSURE....</b>	<b>64</b>
9.1	Description of the Decommissioning Phase .....	64
9.2	Job and income losses .....	64
9.3	Decrease on local economic development funds .....	65
9.4	Permanent loss of agricultural and.....	66
9.5	Sense of place .....	67
9.6	Nuisance factors during decommissioning and rehabilitation .....	69
9.7	Community safety issues .....	70
10.	<b>THE SOCIO-ECONOMIC RISK MANAGEMENT AND MONITORING PLAN .....</b>	<b>71</b>
11.	<b>SUMMARY AND CONCLUSION .....</b>	<b>77</b>
11.1	Summary of Socio-Economic Impact Ratings.....	77
11.2	Conclusion and Recommendation.....	79

<b>12. SOURCES</b> .....	<b>80</b>
<b>12.1 Documents</b> .....	<b>80</b>
<b>12.2 Websites</b> .....	<b>81</b>
<b>12.3 Interviews</b> .....	<b>81</b>

**TABLES**



Table 1: Requirements for specialist reports, as contained in the 2014 EIA Regulations.....	17
Table 2: Population Figures within the study area, 2011 (2016) .....	24
Table 3: Education levels of the Adult Population (20 years plus) within the study area .....	26
Table 4: Unemployment rates, 2011 .....	29
Table 5: The percentage of households in different annual income categories, 2011 .....	29
Table 6: The percentage of households in different annual income categories, 2011.....	30
Table 7: Local Municipal Capacity, 2016/17 .....	33
Table 8: Severity .....	38
Table 9: Spatial Scale .....	39
Table 10: Duration .....	39
Table 11: Frequency of the activity.....	39
Table 12: Frequency of the incident/impact.....	39
Table 13: Legal Issues .....	39
Table 14: Detection.....	40
Table 15: Impact Ratings .....	40
Table 16: Potential direct and flow-on impacts during the construction phase (average).....	41
Table 17: Employment and Income Generation Impact Assessment.....	41
Table 18: Project-Induced In-migration .....	43
Table 19: Increase in Nuisance Factors .....	45
Table 20: Potential direct and flow-on impacts of the Project during the operational phase.....	48
Table 21: Employment and Income Generation Impact Assessment.....	49
Table 22: Potential impact on low income households during the operational phase .....	50
Table 23: Poverty Reduction Impact Assessment .....	50
Table 24: Public Revenue Impact Assessment .....	51
Table 25: Impact on Economic Diversity .....	52
Table 26: Energy and Water Efficiency of Kareerand TSF, 2019 .....	53

Table 27: Impact on Increased Resource Use (Water and Energy).....	53
Table 28: Impact on External Costs to Local Communities.....	57
Table 29: Sense of Place .....	59
Table 30: Nuisance Factors .....	61
Table 31: Community Safety .....	63
Table 32: Job and Income Loss Impact Assessment.....	64
Table 33: Impact caused by the Termination of Social Funds .....	65
Table 34: Impact due to Loss of Agricultural Land.....	67
Table 35: Sense of Place .....	68
Table 36: Nuisance Factors .....	69
Table 37: Community Safety.....	70
Table 38: Socio-Economic Risk Management and MONITORING PLAN.....	71
Table 39: Summary of Socio-Economic Impact Ratings.....	78

**FIGURES**

Figure 1: Existing Infrastructure .....	13
Figure 2: Site layout across operational footprint and TSF expansion footprint. ....	14
Figure 3: TSF expansion site layout in detail, including associated infrastructure.....	15
Figure 4: Dr Kenneth Kaunda District Municipality .....	20
Figure 5: Socio-Economic Sensitive Receptors for the Kareerand TSF Expansion Project .....	23
Figure 6: The economic structure of the City of Matlosana Local Municipality, 2017 .....	27
Figure 7: The economic structure of the JB Marks Municipality, 2017 .....	28
Figure 8: The distribution of different types of taxes to total tax revenues from the Project .....	51

## DOCUMENT STATUS

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# 1. INTRODUCTION

## 1.1 Project Background

Mine Waste Solutions (MWS), also known as Chemwes (Pty) Ltd (Chemwes), has been in business since 1964, and conducts its operations over a large area of land to the east of Klerksdorp, within the area of jurisdiction of the City of Matlosana and JB Marks Local Municipalities (LM), which fall within the Dr Kenneth Kaunda District Municipality (DM) in the North-West Province. The MWS/Chemwes Operations are located primarily to the south of the N12, east of the town of Stilfontein. The closest town is Khuma, located about 2km northwest of the facility, and other nearby towns include Stilfontein (10 km from facility) and Klerksdorp (19 km from facility).

The operations at Mine Waste Solutions entail the collection and reprocessing of mine tailings that were previously deposited on tailings storage facilities (TSFs) in order to extract gold and uranium. High pressure water cannons are used to slurry the tailings on the Source TSFs, then the slurry is pumped by three pump stations and a network of pipelines to the MWS/Chemwes Processing Plant (indicated in dark green in Figure 1), and the residues from the Processing Plants are pumped to the Kareerand TSF (indicated in yellow in Figure 1). Once an old Source TSF has been completely recovered, the objective is to clean it up and rehabilitate the site. See Figure 1 for an overview of the existing infrastructure used for this process.

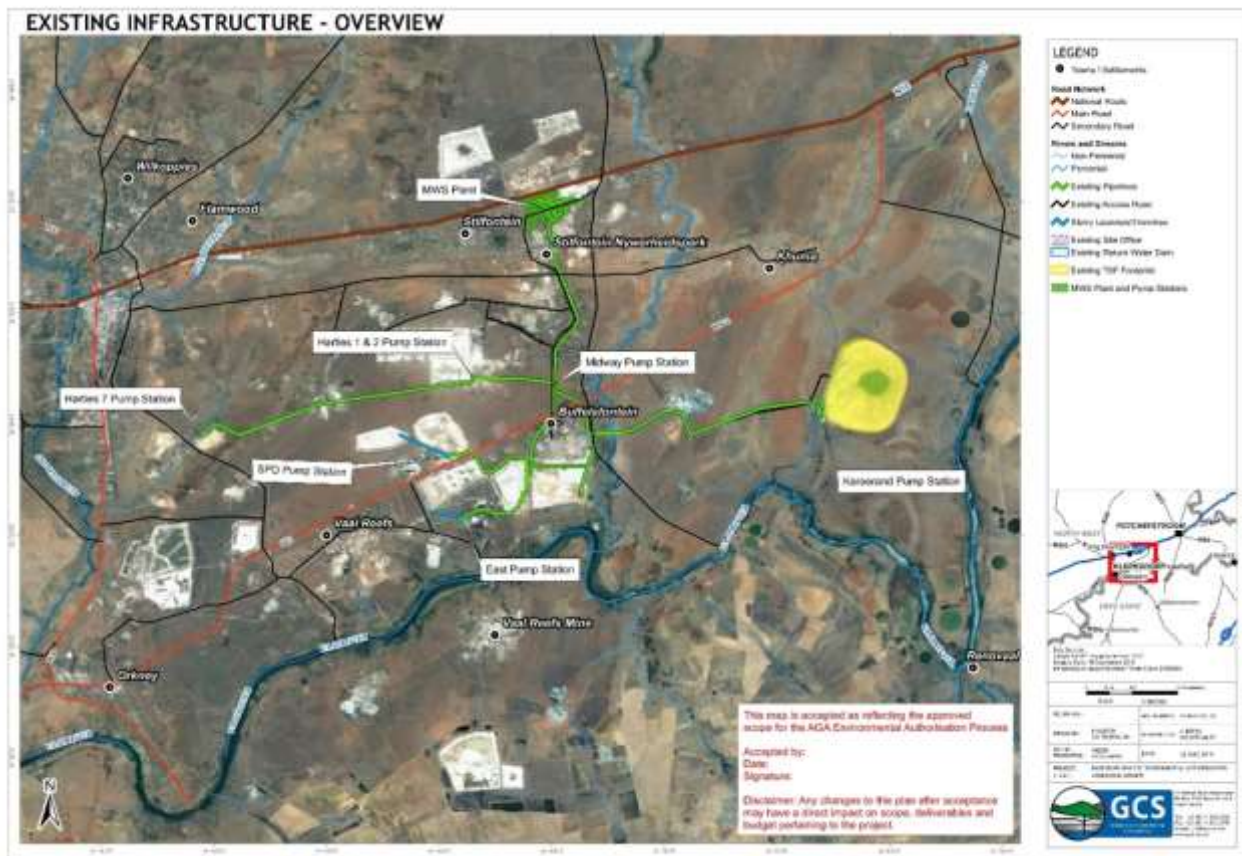
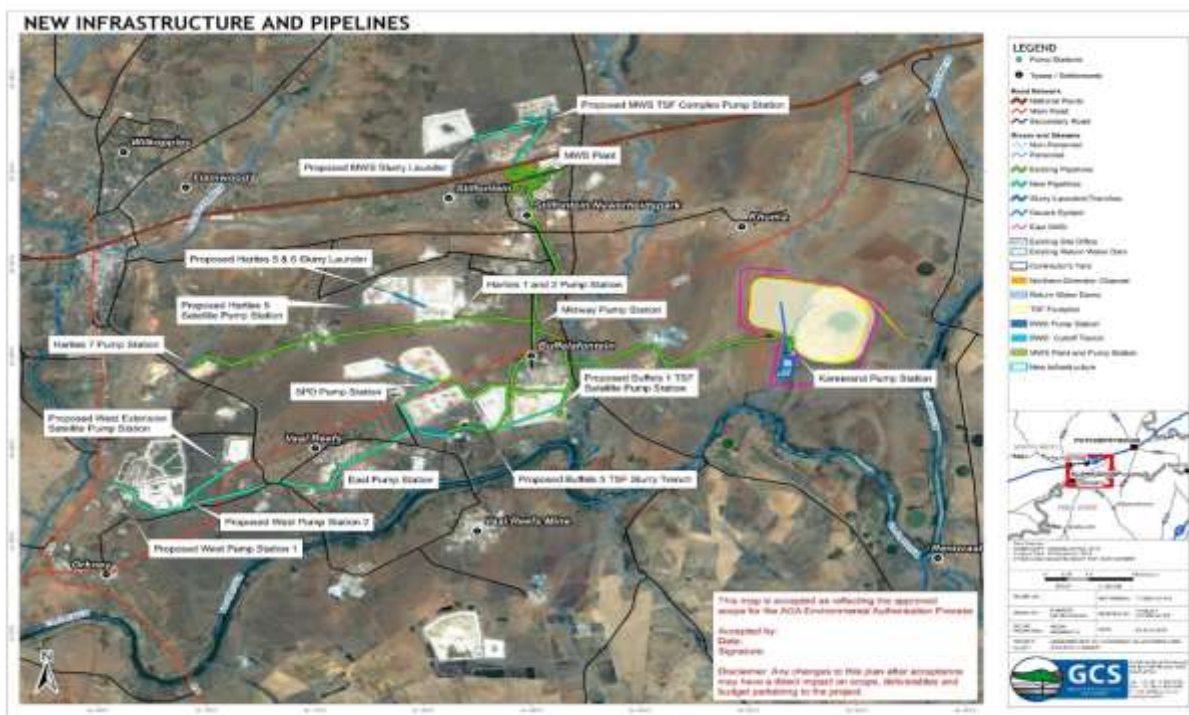


Figure 1: Existing Infrastructure

The Kareerand TSF was designed with an operating life of 14 years, taking the facility to 2025, and total design capacity of 352 million tonnes. Subsequent to commissioning of the TSF, MWS was acquired by AngloGold Ashanti (AGA) and the tailings production target has increased by an additional 485 million tonnes, which will require operations to continue until 2042. The additional tailings therefore require extension of the design life of the TSF. The life of mine is extended to 2042 to accommodate the additional tailings dams owned by AngloGold Ashanti (AGA).

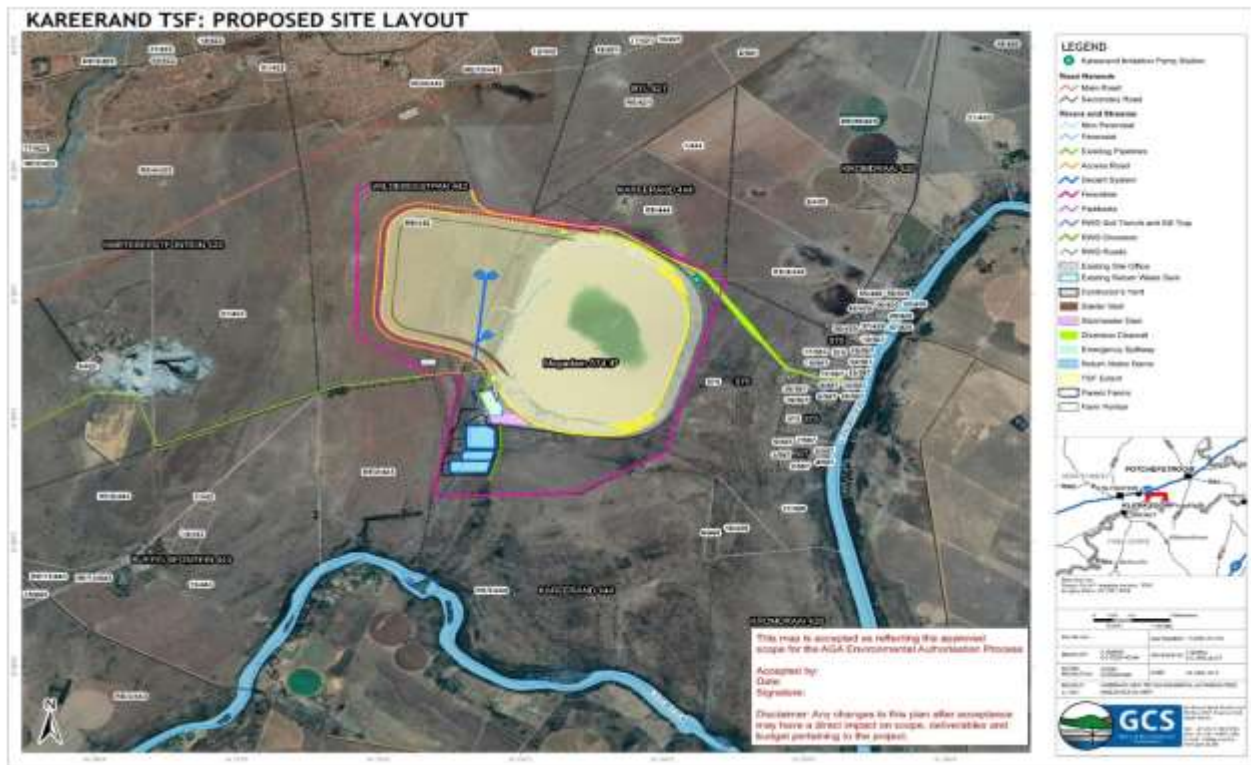
This project entails the expansion of the current Kareerand TSF to accommodate the increased tailings and final design capacity, along with additional pump stations and pipelines. The expansion of the existing TSF will enable the reclamation of additional tailings dams and deposition of the tailings in an expanded facility complete with a geofabric liner and appropriate seepage mitigation measures reducing the total seepage into the Vaal River. The project will aim to support concurrent rehabilitation of the existing TSF and the expansion TSF.



**Figure 2: Site layout across operational footprint and TSF expansion footprint.**

The TSF expansion is proposed on the western edge of the current facility, and the final height of the combined facility (both expansion and current) will be 122m. The expansion footprint will add about 380 hectares (ha) to the existing TSF. Figure 2 depicts the site layout of all additional infrastructure across the operational footprint. As part of Figure 2, the proposed infrastructure and the pipelines are indicated in bright blue (as opposed to existing pipelines indicated in green). The pipeline extends at least 15km south west to the TSF located some 3km north east of Orkney.

Figure 3 depicts the TSF expansion and its associated infrastructure.



**Figure 3: TSF expansion site layout in detail, including associated infrastructure**

The expansion footprint will be designed with a Class C barrier system to accommodate the tailings which have been classified as a Type 3 waste, in accordance with GNR 635. Furthermore, the pipeline network will be expanded to link the Buffelsfontein TSFs to the East pump station as well as the outlying TSFs to the northwest of Orkney. A new slurry trench and two new slurry launders will be developed at the Buffelsfontein, Hartebeesfontein and MWS TSFs respectively. Three new pump stations and two new satellite pump stations will also be added to the footprint of the operation. Two of the main pump stations will be located at the outlying TSFs near Orkney, while the last one will be located at the MWS TSF complex. The two satellite pump stations will be developed at the Buffelsfontein and outlying TSFs respectively.

The proposed project will make use of the existing facilities as well as the following additional supporting infrastructure. The additional infrastructure required across the operational footprint will include new pump stations, new satellite pump stations, slurry launders and connecting slurry and process water pipelines.

As indicated in Figure 2, in the centre of operations, existing infrastructure (pump stations and main slurry and process water pipelines) will be utilised to process adjacent resources. Buffels 5 TSF will be connected to the East Complex Pump Station via a new slurry trench and Buffels 1 TSF will be pumped via a satellite pump station to the Buffels 5 TSF slurry trench feed. At the Harties 1 & 2 Pump Station, located centre to north of Figure 2, Harties 5 & 6 TSF will be directed via a slurry launder to the Harties 1 & 2 pump station. In the west, new pump stations (West Pump Station 1, West Pump Station 2 and a satellite pump station) will be constructed, with main slurry and process water pipelines extended from the existing SPD and East Complex Pump Stations in the east to



the west, allowing for the use of the SPD and East Complex Pump Stations as booster pump stations. In the north, the MWS 4 & 5 TSF's will be reclaimed and directed to a new pump station via slurry launders. New process water and slurry piping will be installed between the MWS 4 & 5 Pump Station and the MWS plant. In total, three new main pump stations and three new satellite pump stations will be built

The existing tailings dams within the subject area impact groundwater quality due to seepage. The expansion of the existing Kareerand TSF will enable the reclamation of existing tailings dams and deposition of the tailings in a new facility complete with appropriate seepage mitigation measures and resultantly reduce the total seepage into the Vaal River.

The project will support concurrent rehabilitation of the existing TSF and the expansion TSF, thereby potentially reducing the risk of windborne dust and storm water management. Another potential long term spin-off from the project is the removal and consolidation all the tailings in the KOSH area on a single expanded tailings storage facility.

## **2. LEGAL REQUIREMENTS AND GUIDELINES**

### **2.1 General**

In South Africa, the National Environmental Management Act, 1998 (NEMA), provides the legal framework for the correct use and management of the environment. In specific, Section 24 of NEMA provides for both the Minister and MEC to identify activities or areas in which certain activities may not be undertaken in absence of an environmental authorization.

Many developments undertaken by both public and private sector organisations require, by legislation, an Environmental Impact Assessment (EIA). An EIA is dependent on the type, scale and size of the specific development. The National Environmental Management Act, Environmental Impact Assessment Regulations, GN R543 ("NEMA EIA Regulations") were published on 18 June 2010 and came into operation on 2 August 2010. These Regulations have been superseded by the 2014 EIA Regulations, GNR 982 published on 4 December 2014, and their amendments (GN 326, 7 April 2017 and GN 706, 13 July 2018).

This TSF expansion requires an Integrated Environmental Assessment process under the National Environmental Management Act NEMA (Act 107 of 1998, as amended) and the National Environmental Management: Waste Act NEM:WA (Act 59 of 2008, as amended).

Other applicable legislations that are referred to include the following:

- National Environmental Management: Air Quality Act, Act No. 39 of 2004 (NEM:AQA)
- National Environmental Management: Biodiversity Act, Act No. 10 of 2004 (NEM:BA);
- Conservation of Agricultural Resources Act, Act No. 43 of 1983 (CARA);
- National Water Act, Act No. 36 of 1998 (NWA);
- The National Heritage Resources Act, Act No. 25 of 1999 (NHRA); and
- Spatial Planning and Land Use Management Act, Act No. 16 of 2013 (SPLUMA)

Together with the NEMA EIA Regulations the assessment of the socio-economic environment came into place and thus the origin for undertaking a Socio-Economic Impact Assessment (SEIA). The guidelines from NEMA thus also apply to the SEIA.

## 2.2 Checklist: Requirements for Specialist Reports, as Contained in the 2014 EIA Regulations

**Table 1: Requirements for specialist reports, as contained in the 2014 EIA Regulations**

EIA REGULATIONS 2014 GNR 982 Appendix 6 CONTENT OF THE SPECIALIST REPORTS	Required at Scoping/Desk-top Phase	Required at BA/EIA Phase	Cross-reference in this Report
a) details of the specialist who prepared the report; and the expertise of that specialist to compile a specialist report including a curriculum vitae;	X	X	Section 133
b) a declaration that the specialist is independent in a form as may be specified by the competent authority;	X	X	Section 133
c) an indication of the scope of, and the purpose for which, the report was prepared	X	X	Section <b>Error!</b> <b>Reference source not found.</b> <b>Error!</b> <b>Reference source not found.</b>
d) the date and season of the site investigation and the relevance of the season to the outcome of the assessment;	X	X	Section 0
e) a description of the methodology adopted in preparing the report or carrying out the specialised process;	X	X	Section 0
f) the specific identified sensitivity of the site related to the activity and its associated structures and infrastructure;	X	X	Section 0
g) an identification of any areas to be avoided, including buffers;	X	X	Sections 0, 7, 8 and 9
h) a map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers	X	X	Section <b>Error!</b> <b>Reference source not found.</b>
i) a description of any assumptions made and any uncertainties or gaps in knowledge;	X	X	Section <b>3Error!</b> <b>Reference source not found.</b>
j) a description of the findings and potential implications of such findings on the impact of the proposed activity, including identified alternatives on the environment;	X	X	Sections 5, 7, 8, 9 and 11
k) any mitigation measures for inclusion in the EMPr		X	Sections 5, 7, 8, 9 and 10
l) any conditions for inclusion in the environmental authorisation;		X	Section 11
m) any monitoring requirements for inclusion in the EMPr or environmental authorisation;		X	Sections 10 and 11
n) a reasoned opinion—  as to whether the proposed activity or portions thereof should be authorised; and		X	Section 11

EIA REGULATIONS 2014 GNR 982 Appendix 6 CONTENT OF THE SPECIALIST REPORTS	Required at Scoping/Desk-top Phase	Required at BA/EIA Phase	Cross-reference in this Report
if the opinion is that the proposed activity or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan;			
o) a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	X	X	Refer to PPP documentation
p) any other information requested by the competent authority	X	X	N/A

### 3. GAPS, LIMITATIONS AND ASSUMPTIONS

With regards to the SEIA undertaken, the following should be noted:

- The SEIA included consultations with selected stakeholders and potentially affected parties as part of the impact assessment phase. This does not form part of the Public Participation Process (PPP) required for the overall EIA process, except where it was specifically specified as such during the consultation sessions.
- A SEIA aims to identify possible social and economic impacts that could occur in future. These impacts are based on existing baseline information. There is thus always an uncertainty with regards to the anticipated impact actually occurring, as well as the intensity thereof. Impact predictions have been made as accurately as possible based on the information available at the time of the study.
- Sources consulted are not exhaustive and additional information can still come to the fore to influence the contents, findings, ratings and conclusions made.
- Socio-economic baseline information was mainly based on official statistics from StatsSA, as well as municipal documentation. Sub-municipal data was only available for 2011. Recent trends as well as information on a sub-municipal level were also based on quantitative and qualitative information received from local representatives with local knowledge. The lack of more recent official socio-economic data is therefore seen as a limiting factor, although it is not anticipated to influence the outcome of the report.
- Technical and other information provided by the EAP is assumed to be correct.
- The potential external costs associated with the project were based on information supplied by sub-specialists for the Environmental Impact Assessment of the project.
- The economic impact model was based on information supplied by the applicant MWS (Pty) Ltd. It was assumed that the expansion will allow activities to continue with financial results continuing on the same level as the past few years;
- Economic multipliers, average salaries and wages and value added as a percentage of total income were based on provincial and national averages.
- An overall rating for the possible decommissioning and closure phase impacts was included although it is recommended that the socio-economic impacts be re-assessed at the time of decommissioning as the local dynamics could have changed.

## 4. SCOPE OF WORK AND METHODOLOGY

### 4.1 Methodology

#### 4.1.1 Scope of the Assessment

The terms of reference for the socio-economic impact assessment (SEIA) of the Kareerand Tailings Expansion Project includes the following deliverables:

- A socio-economic baseline description of the local area surrounding the project area
- Description of the life-cycle socio-economic impacts of the project including the construction, operational, decommissioning and post-closure phases
- Propose mitigation and management measures to enhance positive social benefits and reduce negative impacts on the local socio-economic environment.

#### 4.1.2 Information sources

The socio-economic impact assessment is based on the following sources:

##### Primary sources:

- A visit to the local area on 10 March 2020
- Financial and other organisational information provided by MWS (Pty) Ltd. (HR and SD Departments)
- Telephonic interviews with selected stakeholders

##### Secondary sources (see list of sources in Section 12.3 below):

- Public documents including the Integrated Development Plans of the local and district municipalities, the Provincial Spatial Development Plans and the Provincial Growth and Development Strategy
- Official statistics from Statistics South Africa Census 2001 and 2011 and Community Survey 2017
- Recent media articles and other literature related to the area

#### 4.1.3 Economic modelling:

Input-Output (I/O) modelling was used to assess the project's potential impact on employment and output. The I/O analysis is based on i) **direct impacts** (income and employment created due to employment by the project itself) ii) **indirect impacts** (backward linkages to local suppliers) and iii) **induced impacts** due to the overall increase in income levels and increased spending on goods and services which could lead to a further increase in production and employment in the local area.

## 5. DESCRIPTION OF THE BASELINE ENVIRONMENT

### 5.1 Key aspects of the affected municipalities and other stakeholders

#### 5.1.1 Dr Kenneth Kaunda District Municipality

The project is located in the Dr Kenneth Kaunda District Municipality of North West that borders the north western parts of Free State south of the Vaal River. The tailings facility is located mid-way between Potchefstroom (JB Marks Local Municipality) and Klerksdorp/Orkney (City of Matlosana Local Municipality) and is some 27 km south west from Potchefstroom. Stilfontein forms part of the KOSH area (Klerksdorp, Orkney, Stilfontein, Hartebeesfontein). The area is marked by the

remnants of a number of previously operated gold mines including the Hartebeestfontein, Buffelsfontein and Stilfontein mines.

The Dr Kenneth Kaunda District Municipality is one of four district municipalities in the North West Province. It is located 65km south-west of Johannesburg and borders the Gauteng Province. It is the smallest district in the province, making up 14% of the province's geographical area. The district municipality consists of three local municipalities: JB Marks, City of Matlosana and Maquassi Hills, with its seat in Klerksdorp. The majority of people in the district are Setswana speaking.

It is a region with a rich and diverse natural and cultural heritage, with the potential for sustained economic growth. The region is home to some of the most prominent gold mines in the world and one of the oldest meteor impact sites in the world.

The district is serviced by a number of primary roads, with the N12 Corridor forming the main development axis and serving as a potential concentration point for future industrial, commercial and tourism development<sup>1</sup>. The R502 is situated north of the proposed expansion TSF and links the site with the N12 and various other regional and district roads.



**Figure 4: Dr Kenneth Kaunda District Municipality**

The focus of the study will thus be on the JB Marks Local Municipality and the City of Matlosana Municipality as these municipalities of the Dr Kenneth Kaunda District Municipality function within and close to the study area.

### **5.1.2 JB Marks Local Municipality**

The JB Marks Local Municipality was established by the amalgamation of the former Ventersdorp and Tlokwe City Council Local Municipalities in August 2016. It combines the following areas from

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<sup>1</sup> [www.localgovernment.co.za](http://www.localgovernment.co.za)

the Tlokwe Region: Ikageng and its extensions, Potchefstroom town, Mohadin, Promosa, Matlwang, Leliespan/Baitshoki, Haasskraal, Turfvlei, Vyfhoek, Mooibank, Machavie, Buffeldoorn, Miederpark, Kopjeskraal, Wilgeboom, Lindequesdrift Agricultural Holdings, Rooipoortjie, Venterskroon, Buffelshoek area, Vredefort Dome, the Vaal River, and the rural environment<sup>2</sup>.

### **5.1.3 City of Matlosana Local Municipality**

The City of Matlosana Local Municipality (previously City Council of Klerksdorp) is a Category B municipality situated within the Dr Kenneth Kaunda District. It is situated approximately 164 km to the south west of Johannesburg, on the N12 highway and covers about 3 625km<sup>2</sup>. It is bordered by the Ngaka Modiri Molema District in the north, the Free State Province in the south, JB Marks Local Municipality (Potchefstroom, Ventersdorp area) in the east, and Maquassi Hills Local Municipality (Leeudoringstad and Wolmaransstad areas) in the west<sup>3</sup>.

The City of Matlosana Local Municipality (CMLM) includes Klerksdorp, Jouberton, Alabama, Orkney, Kanana, Stilfontein, Khuma, Tigane and Hartbeesfontein<sup>4</sup>.

The main economic sectors in the municipality include mining, agriculture, manufacturing, services, construction, and transport.

### **5.1.4 Wards and Settlements in the study area**

The Kareerand Tailings Storage Facility (TSF) falls within Ward 2 of the JB Marks Local Municipality. The proposed pipeline extensions to the west of Kareerand TSF however fall in the area of the City of Matlosana and include the rural areas of Ward 34 directly west of the TSF; Ward 33 of the City of Matlosana Local Municipality (including Buffelsfontein and Hartbeesfontein), as well as the southern areas of Ward 21 (including Vaal Reefs mine) and Ward 29 both close to the town of Orkney.

For purposes of the impact assessment the economic baseline description of the local wards adjacent to the project as well as both the JB Marks Local Municipality and the City of Matlosana Local Municipality are relevant. For certain macro impacts such as tax income to central government, the national economy is also relevant.

Khuma and Stilfontein are the settlements closest to the project area. Khuma is situated approximately 2 km to the north of the proposed site and north of the R502 for the expansion of the Kareerand TSF. Khuma township falls within Wards 33, 34, 35 and 38 of the CMLM.

Stilfontein is situated to the north west of the site (approximately 10 km), with the Buffelsfontein Mine to the east. Stilfontein falls within Wards 30 and 31 of the CMLM.

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<sup>2</sup> JB Marks Local Municipality: Final Integrated Development Plan 2018-2019

<sup>3</sup> [www.localgovernment.co.za](http://www.localgovernment.co.za)

<sup>4</sup> City of Matlosana. Integrated Development Plan Review: 2017-2022

### 5.1.5 Land use

Informal cattle farming and/or subsistence cattle grazing (to the west of the site) were observed within the study area. Some crop irrigation and fenced off areas with game were observed to the south and east of the site. A part of the farm Buffelsfontein located to the south and west of the existing TSF is used as a game farm, owned by MWS, but leased to a third party for grazing and game farming.

Various existing mining activities are also undertaken in the larger area. The area is furthermore characterised by various historical mining infrastructure and environmental impacts of such activities were noted mainly to the west of the proposed TSF expansion site. The former Buffelsfontein Mine is located in close proximity to the expansion, with the decommissioned Buffelsfontein Gold Mine Eastern Shaft situated to the west of the existing TSF. There is a proposal to develop the Buffelsfontein Solar Photovoltaic Facility to the north and west of the Eastern Shaft and to the east of the Nicolor Gold Plant.

The larger study area forms part of the N12 treasure route that stretches from Emalahleni in Mpumalanga through Gauteng, and into the North West Province via Potchefstroom close to the Vredefort Dome World Heritage Site. From there it enters the City of Matlosana/KOSH (Klerksdorp, Orkney, Stilfontein and Hartbeesfontein) through Wolmaransstad, Bloemhof and Christiana onto Kimberley in the Northern Cape Province. In the Northern Cape this route later joins the N1 National Route and eventually meets the N2 National Route in George.

### 5.1.6 Sensitive Receptors

The location of the sensitive receptors related to socio-economic impacts is indicated in Figure 5 below:



**Figure 5: Socio-Economic Sensitive Receptors for the Kareerand TSF Expansion Project**

The following sensitive receptors in close proximity to the site are identified:

- The closest settlement to the facility is Khuma (approximately 2 km north-west on the opposite side of the R502). The Khuma community also make use of grazing land close to the Koekemoerspruit (some 3km west from Khuma) for their mainly subsistence cattle. The cattle also drink from Koekemoerspruit. The Spruit is also reportedly used by some Khuma children for informal recreational activities for swimming and playing. The existing pipeline infrastructure is in close proximity to the southward flowing Koekemoerspruit on route to the existing Kareerand TSF;
- Stilfontein, that was established in 1949 as a residential centre for the mines in the area is about 10 km to the north-west, also on the opposite side of the R502;
- Klerksdorp is 22 km to north-west of the Kareerand TSF;
- A number of farms with irrigated farming to the north east and east of the site as well as south of the westward flowing Vaal River. There are some 20 small holdings (1-5 hectares) on the south side of the Vaal River and east of Vermaasdrift Road (S643). Agricultural activities on these small holdings are small-scale and mainly for households' purposes and include some livestock and vegetable farming;
- Tim's Haven is a small residential development consisting of between 20-30 houses on the northern (North West) banks of the Vaal River some 2km east of Kareerand TSF;



- Wawiel Park Holiday Resort and Clementia Wedding and Conference Centre on the southern banks of the Vaal River (6km south west of the Kareerand TSF)
- Renovaal (Free State) is a holiday and residential town across the Vaal River, about 9 km south east from the site.
- Chubby Chick chicken farm about 7km north east from Kareerand TSF
- The Margaret Community located between Stilfontein and the RDP housing extensions of Khuma (Extensions 6, 8, 9 and 10). This former mining community consists of some 60 households that remained behind after the closure of the Margaret Shaft in 2013.

## 5.2 Demographic Profile

### 5.2.1 Population Figures

The JB Marks Local Municipality's population was at 243 527 individuals in 2016 with an average of 38 people per km<sup>2</sup>. The main centres with the most concentrated population figures are Potchefstroom and Ventersdorp<sup>5</sup>.

According to the 2016 Community Survey, the CMLM had a total population of 417 282. The City of Matlosana has a population density of 123 persons per km<sup>2</sup>. The IDP indicated that 92% of the population live in urbanized areas, which includes towns and mining villages. Only 8% live in the rural areas. The largest population concentrations are in Jouberton, Kanana, Khuma and Tigane, which represent 67% of the total urban population<sup>6</sup>.

**Table 2: Population Figures within the study area, 2011 (2016)**

POPULATION FIGURES WITHIN THE STUDY AREA <sup>7</sup>					
Area	Population	Number of Households	% in Under 18 Years Age Group	% in Working Age Category	% males
Ward 2 (JBLM)	14 197	4 802	31%	68%	58%
CMLM rural Wards (21, 29, 33 and 34)	33,848	11,381	30%	66%	54%
Khuma township	45 895	14 154	30%	64%	48%
Stilfontein	17 942	6 651	18%	71%	53%
<b>CMLM</b>	<b>398 674 (417 282)</b>	<b>123 922 (135 896)</b>	<b>36%</b>	<b>59%</b>	<b>50%</b>

<sup>5</sup> JB Marks Local Municipality: Final Integrated Development Plan 2018-2019; [www.wazimap.co.za](http://www.wazimap.co.za); [www.localgovernment.co.za](http://www.localgovernment.co.za)

<sup>6</sup> City of Matlosana. Integrated Development Plan Review: 2017-2022

<sup>7</sup> [www.wazimap.co.za](http://www.wazimap.co.za) (Census 2011) and [www.statssa.gov.za](http://www.statssa.gov.za)

POPULATION FIGURES WITHIN THE STUDY AREA <sup>7</sup>					
Area	Population	Number of Households	% in Under 18 Years Age Group	% in Working Age Category	% males
<b>JB MARKS LM</b>	219 463 (243 527)	69 351(80 573)	38%	60%	50%

Population and household growth in the CMLM have slightly increased over time. The average annual population growth between 2011 and 2016 was 0.9% and the average annual household growth, 1.9%. The household growth has increased over time and in 2015/16 the growth rate was at 1.04%. Population growth showed a slower increase and was at 0.35% in 2016<sup>8</sup>.

In 2011 the Khuma population totalled 45 895 individuals and 14 154 households which totals approximately 11% of the total municipal population<sup>9</sup>.

### 5.2.2 Age Structure and Gender

Table 2 above shows the relatively high percentage of the population falling in the working age category in wards close to the project compared to municipal averages. This is especially the case in Stilfontein, the rural JB Marks ward close to the Kareerand TSF and the CMLM rural wards south west of the TSF. The high percentage of working age population combined with the high percentage males in these areas suggests high levels of in-migration (current/historic) to these areas. In comparison, the relatively low male ratio in Khuma could suggest some out-migration from the township area.

### 5.2.3 Education and Skill Levels

Table 3 below shows that the education levels of the residents of the JB Marks is slightly higher than the CMLM in terms of skilled labour/tertiary qualifications and on par with national averages. The rural JB Marks ward close to Kareerand TSF on the other hand shows relatively low skill levels. Within CMLM, Stilfontein and the rural wards south west to Kareerand TSF display higher skill levels than the municipal average while skill levels in Khuma are on average lower.

<sup>8</sup> City of Matlosana. Integrated Development Plan Review: 2017-2022

<sup>9</sup> www.statssa.gov.za

**Table 3: Education levels of the Adult Population (20 years plus) within the study area<sup>10</sup>**

EDUCATION LEVELS WITHIN THE STUDY AREA <sup>11</sup>			
Area	None	Completed Gr 12 only	Higher Education (Undergrad and Postgrad)
Ward 2 (JBLM)	10%	26%	8%
CMLM rural Wards (21, 29, 33 and 34)	5%	31%	14%
Khuma township	8%	25%	3%
Stilfontein	2%	39%	12%
CMLM	8%	34%	6%
JB MARKS LM	9%	32%	10%

### 5.3 Socio-Economic Profile

#### 5.3.1 Structure of Local Economy

Within the Dr Kenneth Kaunda District, the City of Matlosana makes the largest contribution towards the district's economy with a large concentration of historic gold mines active in the area. Since 2010 the local economy of the City of Matlosana experienced a decline of close to 2% per annum in real terms compared to an already low positive average growth of the national and provincial economies of 1.9% and 0.6% respectively. The decline in economic output also resulted in a decline in formal employment in the economy. It is estimated that the dominant gold mining industry in the area shed around 20 000 jobs due to mine closures since 2010<sup>12</sup>.

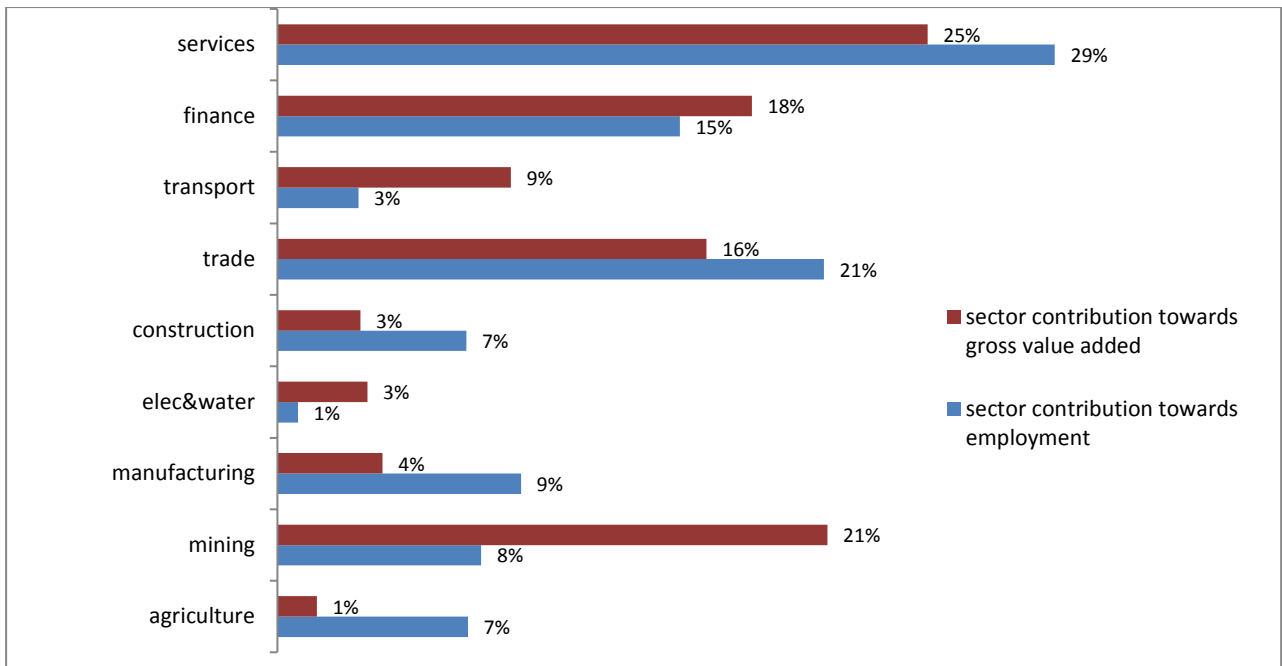
Figure 6 below shows the contribution of the different standard economic sectors towards output and employment in the City of Matlosana Local Municipality. The figure shows that despite the slow-down in mining activities, the mining sector still makes a significant contribution of 21% towards economic output, the second largest contribution after the services sector (mainly public sector services) of 25%. The trade sector also plays an increasing role in the local economy. For example, the construction of the new Matlosana Regional Mall situated on the N12 Treasure Route opened in 2014<sup>13</sup>. The employment contribution of the mining sector however declined dramatically from more than 30% in the local municipal area in 2010 to a mere 8% in 2017.

<sup>10</sup> www.wazimap.co.za (Census 2011) and www.statssa.gov.za

<sup>11</sup> www.wazimap.co.za (Census 2011) and www.statssa.gov.za

<sup>12</sup> Stats SA, 2017; Dr Kenneth Kaunda District Municipality, 2017

<sup>13</sup> City of Matlosana, 2015



**Figure 6: The economic structure of the City of Matlosana Local Municipality, 2017<sup>14</sup>**

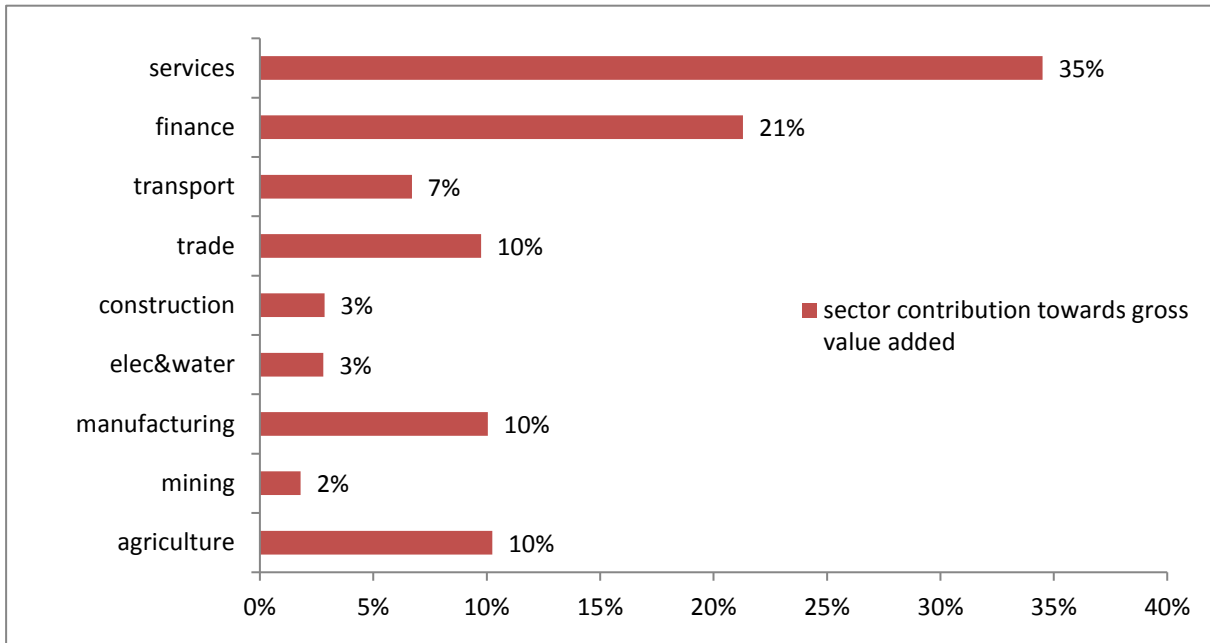
Most of the local mining sector fell just outside the borders of JB Marks Local Municipality with agriculture playing a larger role in North West (former Ventersdorp Municipality) and services and manufacturing playing a larger role in the southern parts (former Potchefstroom/Tlokwe Local Municipality). While the manufacturing sector of JB Marks Local Municipality is smaller than the sector in the City of Matlosana, the sector plays a relatively larger role in the local economy compared to its role in the City of Matlosana economy. The services industry also plays a major role in the JB Marks economy due to the presence of the North West University in Potchefstroom. Figure 7 below shows the large contribution made by the services sector (including higher education and other government services plus private services) to the local economy of JB Marks Local Municipality.<sup>15</sup>

Tourism being a non-standard sector that falls within a number of standard economic sectors including trade, transport and services, makes a relatively small contribution towards the local economies of the City of Matlosana (2%) and JB Marks (3%) compared to its contribution of close to 6% to the national economy. Visits to friends and family is by far the main reason why tourists visit these areas while business and leisure trips contributes only 7% respectively towards tourist trips to the City of Matlosana. Tourist attractions in CMLM are mainly limited to the Stilfontein annual Rose Festival and mine tours, for example to Hartebeestfontein Gold Mine where one can witness

<sup>14</sup> Dr Kenneth Kaunda District Municipality, 2017

<sup>15</sup> JB Marks Local Municipality, 2017; Dr Kenneth Kaunda District Municipality, 2017

a gold pouring session<sup>16</sup>. As previously mentioned, Renovaal (Free State) is a holiday and residential resort across the Vaal River, about 9km south east (upstream) from the site.



**Figure 7: The economic structure of the JB Marks Municipality, 2017<sup>17</sup>**

### 5.3.2 Composition of the labour force

Table 4 below shows the size of the labour force (i.e. the portion of the population aged 15-64 years that offer their services on the labour market) in the relevant areas close to the project. The table shows the larger labour force located in the City of Matlosana compared to JB Marks Local Municipality. It also shows higher unemployment rates in the City of Matlosana compared to JB Marks Local Municipality (formerly Ventersdorp/Tlokwe local municipalities). Ward 2 of JB Marks Local Municipality, where the project is located, furthermore shows lower unemployment rates than unemployment rates in the greater JB Marks Local Municipality and much lower rates than in the City of Matlosana in general or in the wards of the municipality directly adjacent to the project. The table particularly highlights the high unemployment rates in Khuma. The same situation could apply to Margaret community where most of the labour force is recorded to live from social grants while a very small portion does ad hoc work at the Corobrik factory close by.

The youth unemployment rate is on average much higher than the general unemployment rate. In 2011 the national youth unemployment rate was close to 49% whereas the North West provincial rate was 41%. Youth unemployment is especially high in the City of Matlosana (43%) while JB Marks Local Municipality is below the provincial rate at 32%<sup>18</sup>.

<sup>16</sup> Dr Kenneth Kaunda District Municipality, 2017; City of Matlosana, 2015

<sup>17</sup> Based on estimates from JB Marks Municipality , 2017

<sup>18</sup> Dr Kenneth Kaunda District Municipality, 2017

**Table 4: Unemployment rates, 2011<sup>19</sup>**

AREA	total labour force	narrow unemployment rate (excluding discouraged job-seekers)	expanded unemployment rate (including discouraged job seekers)
<b>JB Marks Ward 2</b>	7,253	9.3%	12.8%
<b>CMLM rural Wards (21, 29, 33 and 34)</b>	14,539	28.4%	32.7%
<b>Khuma township</b>	27,140	48.1%	54.0%
<b>Stilfontein</b>	7,900	22.8%	25.8%
<b>JB Marks Local Municipality</b>	<b>87,371</b>	<b>22.7%</b>	<b>27.5%</b>
<b>City of Matlosana Local Municipality</b>	<b>170,207</b>	<b>32.7%</b>	<b>37.2%</b>
<b>North West</b>	<b>1,358,207</b>	<b>31.5%</b>	<b>37.9%</b>
<b>South Africa</b>	<b>20,609,224</b>	<b>29.8%</b>	<b>36.0%</b>

Despite relatively low economic growth rates, the narrow unemployment rate in North West Province declined somewhat from 31% in 2011 to 24% in 2017. However, this is due to the increase in discouraged job-seekers since the expanded unemployment rate stayed more or less the same at 37.5%<sup>20</sup>. With the dismal performance of the economy of the City of Matlosana, the unemployment rate of the municipality and the wards within the municipality directly adjacent to the project is likely to have increased since 2011.

### 5.3.3 Household Income Levels and Poverty

Table 5 below shows the percentage of households that earned R20 000 and less in 2011.

This poverty rate roughly equates to the upper bound poverty income line<sup>21</sup> of Stats SA. While poverty rates in South Africa are already high by international standards, the table shows even higher poverty rates in North West Province.

**Table 5: The percentage of households in different annual income categories, 2011<sup>22</sup>**

AREA	less than R 20 000	R20 000 - R75 000	R75 000- R150 000	R 150 000- R 300 000	R 300 000- R 600 000	more than R 600 000
<b>JB Marks Ward 2</b>	50%	30%	9%	7%	3%	1%
<b>CMLM rural Wards (21, 29, 33 and 34)</b>	38%	35%	14%	9%	3%	1%
<b>Khuma township</b>	52%	39%	6%	2%	1%	0%
<b>Stilfontein</b>	28%	39%	15%	11%	5%	2%

<sup>19</sup> Stats SA Census 2011 in wazimap.co.za

<sup>20</sup> Stats SA, 2018

<sup>21</sup> The upper bound poverty rate include income for basic needs (clothing, housing, food) as well as some basic medical and educational expenses

<sup>22</sup> Stats SA 2011

AREA	less than R 20 000	R20 000 - R75 000	R75 000- R150 000	R 150 000- R 300 000	R 300 000- R 600 000	more than R 600 000
JB Marks Local Municipality	44%	34%	10%	7%	4%	2%
City of Matlosana Local Municipality	44%	34%	10%	7%	3%	1%
North West	47%	35%	9%	5%	3%	1%
South Africa	44%	32%	9%	7%	5%	3%

Poverty rates are similar in the City of Matlosana and JB Marks local municipalities and compared to the national average poverty rate in 2011. With the dismal performance of the local economies since 2011, the poverty rates of both municipalities are currently more likely closer to the higher provincial poverty rate. Khuma had the highest poverty rates of the wards close to the project area followed by Ward 2 of JB Marks. The latter experienced high poverty rates despite relatively low unemployment rates in the ward area (see Table 4 above). This could be due to the dominance of low paid seasonal agricultural workers among the working labour force in this area. Margaret Village could also be considered a poverty hotspot in the local area with high unemployment rates recorded in the area.

Higher-end income groups are more prevalent in JB Marks municipality than in the City of Matlosana.

### 5.3.4 Levels of Economic Inequality in the Local Economy

As is the case nationally and provincially, the income distribution in North West and the City of Matlosana is very skew with a small portion of households earning the larger share of total income generated in the area. The Gini coefficient measures the level of inequality within economies, with an index of 0 indicating perfect equality and an index of 1 perfect inequality. The Gini coefficient for the City of Matlosana was 0.61 in 2006 improving slightly to 0.59 in 2017. Unfortunately no data is available for JB Marks Local Municipality. Based on the provincial situation however it is highly possible that JB Marks faces a similar situation.

**Table 6: The percentage of households in different annual income categories, 2011<sup>23</sup>**

Year	National	North-West	City of Matlosana
2006	0.65	0.61	0.61
2017	0.63	0.61	0.59

### 5.3.5 Economic diversity

The low growth in the traditionally dominant mining sector resulted in the local economy of the City of Matlosana becoming more diverse since 2010, shifting from mining to the services and finance (tertiary) sectors. It should however be kept in mind that increased diversity largely came at the price of a smaller economy in terms of output and employment. In terms of output it should also be kept in mind that the 21% output contribution of the volatile mining sector still indicates the dominant role of this sector in the local economy<sup>24</sup>.

<sup>23</sup> Dr Kenneth Kaunda District Municipality, 2017

<sup>24</sup> Dr Kenneth Kaunda District Municipality, 2017

The JB Marks economy could be slightly more diverse than the City of Matlosana with a larger number of sectors (government and financial services, agriculture and the diverse manufacturing sector) playing relatively large roles in the local economy.

## **5.4 Basic Service Delivery**

### **5.4.1 Town Planning and Housing Provision**

The most pressing need for additional housing within the CMLM is within the Alabama Ext 5 section, Khuma and Jouberton areas. Suitable land for township establishment at Khuma, however, is scarce due to geological constraints within the area.

The municipality is addressing the problem through the Spatial Development Framework, although funding for these projects must still be finalized<sup>25</sup>.

Within the JB Marks Local Municipality, 63% of houses in the municipal area are classified as formal while approximately 10% of houses are located within informal settlements. Flats, apartments and backyard dwellings make up 7% of households<sup>26</sup>.

All the wards in the municipality indicated that there is a need for additional housing facilities and infrastructure. Land for additional housing infrastructure should thus be allocated, but dolomitic conditions, especially in the Ventersdorp area, provide some challenges in this regard<sup>27</sup>.

### **5.4.2 Road Infrastructure**

There is a vast network of roads within the CMLM that requires maintenance and upgrading to ensure the mobility of goods and people and also promote socio-economic development within the City of Matlosana. Proper storm water management plays a vital role in the maintenance of these roads. The promotion of vehicular and pedestrian safety should furthermore receive attention<sup>28</sup>.

The roads within the JB Marks Local Municipality require maintenance and upgrading, especially re-surfacing. Due to the amalgamation of the two municipalities into one structure, an Integrated Roads Master Plan needs to be developed, which must address the road requirements in the various areas. A proposed future road network was further being planned for the urban area in cooperation with SANRAL.<sup>29</sup>

The main roads in the study area include the N12 and the R502. The Vermaasdrift Road is used to access tourist related facilities to the south of the Vaal River. This road again links with the S643 (west of the proposed TSF expansion) and then with the R502.

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<sup>25</sup> City of Matlosana. Integrated Development Plan Review: 2017-2022

<sup>26</sup> JB Marks Local Municipality: Final Integrated Development Plan 2018-2019

<sup>27</sup> JB Marks Local Municipality: Final Integrated Development Plan 2018-2019

<sup>28</sup> City of Matlosana. Integrated Development Plan Review: 2017-2022

<sup>29</sup> JB Marks Local Municipality: Final Integrated Development Plan 2018-2019



### 5.4.3 Electricity Infrastructure

Eskom and the CMLM are the two licensed distributors of electricity within the CMLM's jurisdiction. Eskom provides electricity to households in Kanana, Khuma, Tigane and those on private farms, whilst the CMLM provides electricity to the towns of Klerksdorp, Orkney, Stilfontein and Hartbeesfontein (KOSH) as well as Jouberton, Alabama and Manzilpark<sup>30</sup>.

Currently the municipality has provided electricity to 99% of households in formalised human settlements, although some houses still need to be electrified. In addition, electricity losses at the end of 2016 were at 27%, which exceeds acceptable losses. These losses can be attributed to technical issues such as overloading of the network and the aging infrastructure, but also to incorrect billing, illegal connections and unaccounted consumption due to non-metering.

The municipality has made progress in the implementation of strategic plans to address these losses.

Within the JB Marks Local Municipality, 88% of the households had access to electricity for lighting purposes. An electricity Master Plan that would incorporate the Tlokwe and Ventersdorp areas must be developed to obtain a comprehensive picture of the needs within the municipal area to support the envisaged demand and growth<sup>31</sup>.

### 5.4.4 Health Services and Infrastructure

The Duff Scott Hospital in Stilfontein and the Klerksdorp Tshepong Hospital, together with some clinics in Khuma (Khuma and Botshabelo Clinics), Stilfontein (Marcus Zenzile and Stilfontein Clinics) and Klerksdorp are the main health care services provided in the area. Some other private hospitals and clinics are located in Klerksdorp and Potchefstroom<sup>32</sup>.

From the CMLM IDP it is clear that the clinics and staff are functioning at capacity and that there is the need for extension of the services provided.

### 5.4.5 Safety and Security

The Khuma and the Stilfontein Police Stations are the nearest operating in the study area. Community requests, as noted as part of the public participation process undertaken for the development of the City of Matlosana Local Municipality's Integrated Development Plan (IDP), indicate that there is a need for the development of satellite stations in the area to address safety and security issues.

Newspaper articles indicate that illegal miners are of concern in the Stilfontein and Khuma areas due to the presence of abandoned mining sites. Arrests have been made in the past<sup>33</sup>. Illegal

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<sup>30</sup> City of Matlosana. Integrated Development Plan Review: 2017-2022

<sup>31</sup> JB Marks Local Municipality: Final Integrated Development Plan 2018-2019 & [www.localgovernment.co.za](http://www.localgovernment.co.za)

<sup>32</sup> [www.thinklocal.co.za](http://www.thinklocal.co.za) & [www.search.info4africa.org.za](http://www.search.info4africa.org.za)

<sup>33</sup> [www.iol.co.za](http://www.iol.co.za) & [www.northwestnewspapers.co.za](http://www.northwestnewspapers.co.za)

miners pose various threats to the social well-being of the local communities such as an increase in criminal syndicates, theft and vandalism, as well as victimisation of local community members.

#### 5.4.6 Water Provision and Sanitation Infrastructure

Within the CMLM, 48% of households receive piped water inside their houses, with the same figure receiving water inside their yards. Only 2% of households are still reliant on water from a communal tap and 1% from a borehole. The CMLM is further providing access to sanitation services (flush or chemical toilets) to 96% of the households. Within the relevant wards of the CMLM in the study area, between 96% and 99% received water services from the service provider and between 92% and 99% received sanitation services by means of flush or chemical toilets.<sup>34</sup>

Within the JB Marks LM, water for Potchefstroom is treated and distributed from two separate water treatment plants, namely the Old Water Treatment Works (WTW), and the Lakeside Water Treatment Works. These are operating close to capacity and water shortages have been experienced. Due to the existing constraint, the Tlokwe City Council has embarked on a capital development project to augment bulk water supply as part of the Tlokwe City Council Regional Bulk Infrastructure Programme (RBIP) funded in part by DW&S.

On the other hand, the Ventersdorp Region relies heavily on underground boreholes as its source. Challenges in relation to boreholes include high population growth that outstrips the supply, increased informal settlements in sensitive dolomitic areas and infrastructure decay<sup>35</sup>.

Within Ward 2 of the JB Marks Local Municipality, 69% of the households are still reliant on borehole water as main source. This is due to the agricultural characteristics of the area. Furthermore, only 55% have access to flush or chemical toilets<sup>36</sup>.

#### 5.4.7 Institutional Capacity

Table 7 shows the institutional challenges faced by both the CMLM and JB Marks Local Municipality.

**Table 7: Local Municipal Capacity, 2016/17<sup>37</sup>**

Governance issue	CMLM	JB Marks	South Africa
Household density/km <sup>2</sup>	38	13	12
Water service delivery backlogs (% of households without access to potable water)	4%	14%	33%
Sanitation service delivery backlogs (households without flush/ chemical toilets)	7%	28%	36%
% of population living in informal settlements	0.4%	14%	3%
% of population living in informal houses (shacks)	15%	20%	13%

<sup>34</sup> www.wazimap.co.za

<sup>35</sup> JB Marks Local Municipality: Final Integrated Development Plan 2018-2019

<sup>36</sup> www.wazimap.co.za

<sup>37</sup> Municipal Demarcation Board (2018), National Treasury (2019)

Governance issue	CMLM	JB Marks	South Africa
% of municipal area with mining licenses	10.3%	16.7%	6.7%
% of land with natural heritage assets	0.2%	1.2%	7%
Blue drop score (drinking water quality)	77% (good)	Critical (Ventersdorp) Very good (Tlokwe)	-
Green drop score (wastewater quality management) (2014)	40% (very poor)	Not available Tlokwe received honourable mention	-
Municipal audit result (2018)	Unqualified	Qualified	Unqualified with findings
Money generated locally % of revenue (2018)	79%	80%	-
Fruitless and wasteful expenditure (norm=0) (2018)	12%	16%	13%
Spending of capital budget (% over or –below) (norm 5% +/-) (2018)	-14%	-27%	-29%
Spending operational budget (% over + or –below) (norm 5% +/-) (2018)	-12%	-6%	+9%
Cash coverage (months of operating expenses that can be covered with cash available) (ideally 3 months) (2018)	0 days	1.8 months	1.6 months average
Spending on maintenance and repairs as % of capital equipment (ideally 8% of asset value p.a.)	1.6%	2.0%	0.1%
Current debtors collection rate (%) (70%-80%) (2018)	60%	70%	64%
% of vacancies at municipality	40%	465%	14%
% of staff with some tertiary/technical qualifications	12%	0%	-

While service delivery backlogs are relatively low in the CMLM and JB Marks Local Municipality, both municipalities face challenges in terms of a relatively high portion of households living in informal houses, (albeit in fewer settlements); municipal financial management, relatively high portion of mines operational in the municipal areas and specifically high levels of municipal vacancies and low skill levels of municipal staff. Of particular concern are challenges related to wastewater treatment in CMLM<sup>38</sup> that, together with the high level of mining activities in the local area, has negative implications for the high levels of pollution already present in the Vaal River system.

The enforcement of and compliance monitoring to environmental legislation by a public ombudsman is a challenge in the area due to capacity constraints in terms of managing the water quality challenges within the Integrated Vaal River System. The potential lack of external enforcement and monitoring capacity could increase the environmental risks for the Kareerand TSF expansion project. Some challenges that are highlighted by NGOs include (The Federation for a Sustainable Development, 2018):

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<sup>38</sup> Tlokwe LM received special mention in the Green Drop 2014 Progress Report alongside Rustenburg LM as municipalities with the lowest risk profiles in terms of waste water management. The situation could however have changed substantially since 2014 particularly in the light of the absence of technical skills at the merger municipality of JB Marks

- The lack of a Strategy Steering Committee to be established to oversee the further development and implementation of the Water Quality Management Plans and Strategies for the Vaal River Basin;
- The complexity of the current existing regulatory frameworks with a lack of policy and legislation alignment between Department of Water and Sanitation (DWS), Department of Agriculture, Forestry and Fisheries (DAFF) and the Department of Mineral Resources (DMR);
- Inadequate maintenance and control of effluent from waste water treatment by municipalities, including the CMLM as observed above;
- Lack of regulatory capacity in the water sector in terms of skilled staff and financial resources;
- The lack of capacity to collect, collate and analyse information on a regular basis;
- The challenge of the general lack of water resource quality in South Africa reflecting that more than 80% of water resources are compromised in terms of fitness for use for some or another user group;
- The lack of political will to hold major polluters accountable;
- The insufficient funding of Integrated Water Quality Management after mine closure remains a significant challenge.

## 5.5 Development Priorities

The development objectives that are contained in the following provincial, district and municipal development plans emphasise the need for the local economies of the City of Matlosana and JB Marks municipality to diversify away from the mining sector and to develop the manufacturing sector. Specific objectives include the following:

**The North West Provincial Growth and Development Plan for 2030 (2013)** focuses on economic transformation in the North West Province, which includes the following:

- Diversification of economic base away from the dominant mining sector and the development of industries with comparative advantage and/or development potential
- Skills development
- Creating an enabling environment for small businesses
- An integrated and inclusive rural economy
- Human settlement and spatial transformation
- Improving education, training and innovation
- Building a capable and developmental state
- Fighting corruption
- Transforming society and uniting the province

The North West Spatial Development Framework (2016) focuses on nodal and corridor development, including a number of competitiveness corridors. These corridors, including Treasure Corridor, are aimed at strengthening linkages between Johannesburg, Potchefstroom, Klerksdorp and areas further south along the N12 national road. Potchefstroom and Klerksdorp are furthermore considered primary investment nodes in the province.

The objectives of the **Spatial Development Framework of Dr Kenneth Kaunda District Municipality** are:

- Diversification of the economic base
- Accelerating growth in agriculture, tourism, industries and export sectors (metals, clothing, textiles, agro-processing, mineral beneficiation and manufacturing)
- Innovation and competitiveness in the manufacturing sector is a critical component in the strategy to significantly increase the potential of the manufacturing sector to contribute towards the overall development of the district
- Ensure sustainability by identifying possible conflict zones between proposed development and environmental sensitive areas
- Bringing marginalized communities into economic mainstream
- SMME development and skills development
- Strengthening and concentration of developments along N12
- Identification of available land and infrastructure to accommodate development along the corridor

The focus areas of the **JB Marks Local Municipality Spatial Development Framework** are:

- Provision, maintenance and upgrading of infrastructure (water and electricity, waste and sanitation, roads)
- Focus investments in priority projects along N12 Corridor
- Eco-tourism activities (focused in Municipal wide-open space system)
- Revitalization of the CBD in both Regions (Potchefstroom and Ventersdorp)
- Promote accessibility of communities to employment, recreation and social opportunities

**The City of Matlosana Integrated Development Strategy** focuses on the following issues:

- The regeneration of the manufacturing sector
- The growth of tourism and the linkages to the sector
- The growth of agriculture
- The development and growth of the information technology sector.
- The re-skilling of the labour force.
- The regeneration of industrial areas and CBD's and upgrade of residential areas.
- Facilitate the utilization of co-operatives in the municipality's procurement system
- Facilitate the growth and contribution of SMME's.

Based on information within the respective municipal Integrated Development Plans (IDPs), the following most pressing needs were listed which provide vital information with regards to the socio-economic characteristics within the wards within the larger study area<sup>39</sup>

- Ward 2 (JB Marks Local Municipality) is characterised by agricultural land-uses and various smallholdings. Limited job opportunities apart from work on the smallholdings are available. Transport is thus also problematic and the roads (mostly gravel) are in poor condition and require maintenance. Illegal land-uses are challenging and are sometimes in conflict with residential and agricultural land-uses in the area. General service delivery to the area needs to be upgraded. Mining and agri-businesses need to comply with NEMA.
- CMLM rural wards south west of the project area:
  - Ward 34 has a backlog in terms of the provision of housing, especially at the Down, and Popo Molefe Sections. Roads need to be paved, high mast lighting infrastructure must be maintained, sewage, water and sanitation infrastructure are required, illegal dumping is problematic, and there is a need for skills development among the youth.
  - Ward 33 is characterised by an influx of people and a high unemployment rate. Housing infrastructure is required, roads need to be upgraded, the water and sanitation system requires some infrastructural upgrades, illegal dumping is problematic, high mast lighting infrastructure is required in certain areas to improve the security, the Botshabelo clinic requires an extension and has a shortage of staff, there is a need for additional recreational and educational facilities, and skills development especially among the youth is critical.
  - Wards 21 identified sewerage upgrades, taxi ranks, sport and community facilities, electricity connections, primary healthcare services, small scale mining opportunities and skills development as priority areas.
  - Ward 29 identified road and stormwater maintenance, a community hall, the cleaning of open spaces and SMME development as priority issues in their area.
- Khuma wards:
  - Ward 35 (CMLM) requires urgent attention to town planning issues, as houses are needed, some stands need electrification and engineering services, incomplete houses need to be completed, water infrastructure is required in certain areas, unemployment needs to be addressed, and farming projects should be revitalised
  - Ward 38 (CMLM) requires high mast lighting to improve safety and security. Streets need to be paved, incomplete houses need to be completed and damaged houses require structural repairs, water infrastructure has to be repaired and to be installed in

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<sup>39</sup> JB Marks Local Municipality: Final Integrated Development Plan 2018-2019 and City of Matlosana. Integrated Development Plan Review: 2017-2022

Ext. 4 and 7, illegal dumping should be controlled, and skills development required especially among youth due to the high unemployment levels.

- Stilfontein wards:
  - Ward 30 (CMLM) prioritises the upgrade of roads and the water supply network, extension of taxi ranks and the opening of the fire station. In addition the community applied for the establishment of a fish farm to create employment opportunities but no progress seems to have been made yet.
  - Ward 31 (CMLM) identified storm water and road maintenance, the upgrade of the sewerage system and the maintenance and repair of street lights as priorities in their area. In addition community members voiced concern over the illegal occupation of land in their area. Other priority needs that are highlighted include a primary healthcare clinic in the area sport and community facilities as well as SMME support.

Due to the closure of mines and the migration of families from drought affected farming settlements, coupled with the disaggregation of the existing families in various settlements, more pressure is placed on the need for the upgrading of the core bulk infrastructure in CMLM.

## 6. SOCIO-ECONOMIC IMPACT METHODOLOGY

The following methodology was used to rank the anticipated impacts. Clearly defined rating and ranking scales were used to assess the impacts associated with the proposed activities (Refer to the tables below).

Each impact identified was rated according to the expected magnitude, duration, scale and probability of the impact. Each impact identified was assessed in terms of scale (spatial scale), magnitude (severity) and duration (temporal scale). Consequence is then determined as follows:

$$\text{Consequence} = \text{Severity} + \text{Spatial Scale} + \text{Duration}$$

The Risk of the activity is then calculated based on frequency of the activity and impact, how easily it can be detected and whether the activity is governed by legislation. Thus:

$$\text{Likelihood} = \text{Frequency of activity} + \text{frequency of impact} + \text{legal issues} + \text{detection}$$

The risk is then based on the consequence and likelihood.

$$\text{Risk} = \text{Consequence} \times \text{likelihood}$$

**In order to assess each of these factors for each impact, the ranking scales in Table 8: Severity to**

Table 12 were used.

**Table 8: Severity**

<b>Insignificant / non-harmful</b>	<b>1</b>
Small / potentially harmful	2
Significant / slightly harmful	3
Great / harmful	4
Disastrous / extremely harmful / within a regulated sensitive area	5

**Table 9: Spatial Scale**

This refers to the size of the area that the aspect is impacting on.

<b>Area specific (at impact site)</b>	<b>1</b>
Whole site (entire surface right)	2
Local (within 5km)	3
Regional / neighboring areas (5km to 50km)	4
National	5

**Table 10: Duration**

<b>One day to one month (immediate)</b>	<b>1</b>
One month to one year (Short term)	2
One year to 10 years (medium term)	3
Life of the activity (long term)	4
Beyond life of the activity (permanent)	5

**Table 11: Frequency of the activity**

This refers to how often the specific activity occurs.

<b>Annually or less</b>	<b>1</b>
6 monthly	2
Monthly	3
Weekly	4
Daily	5

**Table 12: Frequency of the incident/impact**

This refers to how often the activity would impact on the environment.

<b>Almost never / almost impossible / &gt;20%</b>	<b>1</b>
Very seldom / highly unlikely / >40%	2



Infrequent / unlikely / seldom / >60%	3
Often / regularly / likely / possible / >80%	4
Daily / highly likely / definitely / >100%	5

**Table 13: Legal Issues**

This refers to how the activity is governed by legislation.

<b>No legislation</b>	<b>1</b>
Fully covered by legislation	5

**Table 14: Detection**

This refers to how quickly/easily the impacts/risks of the activity can be detected on the environment, people and property.

<b>Immediately</b>	<b>1</b>
Without much effort	2
Need some effort	3
Remote and difficult to observe	4
Covered	5

Environmental effects will be rated as either high, moderate or low significance on the basis provided in Table 15.

**Table 15: Impact Ratings**

<b>RATING</b>	<b>CLASS</b>
1 – 55	(L) Low Risk
56 – 169	(M) Moderate Risk
170 – 600	(H) High Risk

## 7. SOCIO-ECONOMIC IMPACTS DURING CONSTRUCTION

### 7.1 Description of the Construction Phase

The construction is scheduled over a 5 year period from 2021 to 2025 and the total construction cost is estimated at R1.3bn (2019 terms). The construction will be awarded to a main contractor who will coordinate the total project. The main contractor will use its own resources as well as sub-contractors. The construction works include the expansion of the current Kareerand TSF along with additional pipelines along the expansion. The TSF expansion is proposed on the western edge of the current facility and the height of the combined facility (current and expansion) will be 122m. The expansion footprint will be 380 hectares (ha) to the current Kareerand TSF and approximately 93 additional ha will be cleared for supporting infrastructure.

The construction phase will include the following activities:

- Earthworks including the clearing and grubbing of the site, stripping and stockpiling of the topsoil, excavations as well as concurrent rehabilitation through vegetating the side slopes by means of hydro-seeding with a seed mix compatible with local conditions
- Installation of drainage systems
- Installation of a geo-membrane liner
- Construction of the return water dams, sediment traps and ancillary works
- Installation of the pipelines

## 7.2 Temporary jobs and income

As mentioned above, the duration of the construction phase is expected to be 5 years and could lead to the employment of some 270 people directly involved in construction activities (depending of the type of construction activity undertaken at the time) with an estimated 120 jobs for unskilled workers, i.e. 44% of the workforce. A further 45% of workers (122) could furthermore be semi-skilled (i.e. completed matric or equivalent technical qualification). A relatively small portion of the construction workforce (12%) would be skilled (with tertiary qualifications).

The flow-on impacts (indirect and induced<sup>40</sup>) could result in additional employment for some 300 workers.

In the context of approximately 20 000 unemployed people in the wards around Kareerand TSF (13 000 located in Khuma), the impact will be relatively small. The potential income and employment impacts during construction are illustrated in Table 16 below. As a rough indication, the total construction spending of R 1.3bn (2019 terms) is evenly distributed over 5 years.

The figures in the table present a high case scenario and the actual materialisation of these impacts would depend on the employment elasticity of the construction sector at the time of construction.

**Table 16: Potential direct and flow-on impacts during the construction phase (average)**

Rm (2019 prices)	2019	2020	2021	2022	2023
Planned construction spending (Rm, 2019 terms)	254	254	254	254	254
Direct GVA <sup>41</sup> (Rm, 2019 terms)	102	102	102	102	102
Direct employment (numbers)	270	270	270	270	270
Flow-on GVA (Rm, 2019 terms)	159	159	159	159	159
Flow-on employment	308	308	308	308	308

**Source:** Based on information of AGA (2020). Stats SA (2017 and 2019)

<sup>40</sup> Indirect impacts result from spending on suppliers and induced impacts from increased spending due to the increased income from direct and indirect employment

<sup>41</sup> GVA = Gross value-added consisting of salaries and wages, profit, interest and rent income

The significance of impacts associated with the employment and income generation is assessed in Table 17 below.

**Table 17: Employment and Income Generation Impact Assessment**

<b>THEME: Temporary jobs and income</b>		
	<b>Without mitigation</b>	<b>With mitigation / enhancement</b>
<b>Status</b>	Positive (+)	Positive (+)
<b>Severity</b>	3	3
<b>Spatial Scale</b>	3	4
<b>Duration</b>	3	3
<b>Frequency of activity</b>	4	4
<b>Frequency of impact</b>	4	4
<b>Legal Issues</b>	1	1
<b>Detection</b>	1	1
<b>Impact rating</b>	Medium (90) +	Medium (100) +
<b>Enhancement:</b>		
<ul style="list-style-type: none"> <li>• Prioritise local (Khuma) labour in the recruitment process as part of the company's own recruitment policy or as part of contractor management plan</li> <li>• Prioritise recruiting unskilled workers among the local unemployed.</li> <li>• Provide up-skilling opportunities for unskilled local workers during the construction phase</li> <li>• Explore possible placement of local construction workers in reclamation operations if additional jobs become available</li> </ul>		
<b>Cumulative impacts:</b>		
<ul style="list-style-type: none"> <li>• Other mining activities in the area not related to the TFS (e.g. north of the N12)</li> </ul>		
<b>Residual impacts:</b>		
<ul style="list-style-type: none"> <li>• Up-skilled labour force (positive)</li> </ul>		

**Expected areas of impact:** CMLM, JB Marks LM and adjacent North West, Free State and Gauteng regions.

**Expected cumulative impacts:** Other mines operational and expanding in the local area could add to the creation of additional employment opportunities and subsequent income generation. For example Quest Mine has recently submitted an environmental application to commence with underground and opencast mining north of the N12 some from 18km north- west from Kareerand TSF. However, based on the skills levels required, these opportunities might not be solely confined to benefit of the local area.

### 7.3 Negative impacts related to project-induced population influx

The project is likely to result in some formal and informal population influx mainly based on rumours about possible additional work associated with the expansion project. Due to the number of existing and historical mines in the area around Stilfontein and Khuma, one could expect that ongoing movement of potential jobseekers into the area is a given reality as former mine employees were not necessarily absorbed by other (especially local) sectors. Historic in-migration is an issue, especially in Stilfontein, the rural JB Marks ward close to the Kareerand TSF (Ward 2) and the

CMLM rural wards south west of the TSF (Wards 33 and 34). Land invasions in Stilfontein and Khuma create various challenges and led to violent protests in 2019.

As indicated above, the impact of the expansion project’s construction phase in terms of job creation will be small in relation to the number of the existing unemployed population, but moderate in earning potential. In-migration of additional people will thus result in additional pressure on the provision of infrastructure and services, especially housing and primary health care and emergency services, which are already an issue in the adjacent wards.

Spill over effects of the anticipated formal and informal population influx can result in an increase in criminal activities in the larger study area, driven by the high unemployment numbers and social conflict and rivalry regarding available and affordable housing.

The informal population influx is difficult to mitigate and cannot be attributed to the expansion project, as it is an existing impact in the region. It is, however, likely to increase in the short term.

Potential intrusion impacts on nearby landowners are further anticipated as a result of the influx of workers and movement of workers and machinery, especially where the S643 road is used as access road.

**Table 18: Project-Induced In-migration**

<b>THEME: Project-Induced In-migration</b>		
	<b>Without mitigation</b>	<b>With mitigation / enhancement</b>
<b>Status</b>	Negative (-)	Negative (-)
<b>Severity</b>	3	2
<b>Spatial Scale</b>	4	4
<b>Duration</b>	3	3
<b>Frequency of activity</b>	4	4
<b>Frequency of impact</b>	4	4
<b>Legal Issues</b>	1	1
<b>Detection</b>	2	2
<b>Impact rating</b>	<b>Medium (110) -</b>	<b>Medium (99) -</b>
<b>Mitigation:</b>		
<ul style="list-style-type: none"> <li>• Prioritise local (Khuma) labour in the recruitment process as part of the company's own recruitment policy or as part of contractor management plan</li> <li>• The development, publication and widespread dissemination of a recruitment policy could serve to encourage local employment and reduce the potential influx of jobseekers to the area</li> <li>• A communication strategy should be launched to ensure that unrealistic employment expectations are not created</li> </ul>		
<b>Cumulative impacts:</b>		
<ul style="list-style-type: none"> <li>• Other mining activities in the area not related to the TFS (e.g. north of the N12)</li> <li>• Proposed Buffels Solar Energy Project – if the construction phases run concurrently</li> </ul>		
<b>Residual impacts:</b>		
<ul style="list-style-type: none"> <li>• Additional pressure on provision of housing and related infrastructure and health, emergency and safety services</li> </ul>		

**Expected areas of impact:** CMLM, JB Marks LM.

**Expected cumulative impacts:** Proposed mining projects and solar facility could increase the inflow of outsiders to the area if the construction phases run concurrently.

## 7.4 Nuisance factors

### Traffic Movement

Construction activities will mainly include site clearing and preparation of the site, excavations (including stockpiling of soil resources) and the establishment of the required infrastructure on site. It is anticipated that between 88 and 123 construction vehicles will be on site mainly to undertake earthworks<sup>42</sup>. Movement of heavy machinery and vehicles are anticipated to take place within the boundaries of the site with limited movement of construction vehicles on the provincial (R502), secondary (S643) and national roads (N12). Vehicles making use of the roads will include personnel transport and construction material delivery. The total number of the vehicle fleet on site is anticipated to remain the same as for the existing TSF, except when concurrent rehabilitation is undertaken. The increase in vehicle movement as a result of the concurrent rehabilitation is not known. One can thus only conclude that the increased noise and dust created by these vehicles will be intermittent and of a short duration.

### Dust

Community representatives of Khuma situated to the north of the proposed expansion, indicated that they experience intermittent dust pollution and that the majority of complaints from community members are during the windy months e.g. August. It should be noted that it is difficult to determine the source of the dust pollution resulting in these complaints, as there are various tailings facilities present within the larger area. Community members, such as those suffering from TB and related respiratory illnesses can be more at risk. Community representatives are thus concerned that the dust impacts would increase and would result in further negative impacts on the health of the community. Primary health care services are functioning at capacity and community members feel that their needs are not met.

The construction activities and site establishment, as well as the movement of vehicles will result in some emissions and dust pollution. According to the findings of the Air Quality Assessment (AQA)<sup>43</sup>, the increase in dust and emissions has a low likelihood to negatively impact on human health. It would rather have a nuisance value, as the dust fallout rates were below the National Dust Control Regulations (NDCR) limit for residential areas and concentrations are in compliance at the Air Quality Sensitive Receptors. However, should any negative impacts be caused during the construction phase, sensitive receptors to the south and south east could be affected as the dominant wind direction in the area is from a north westerly direction.

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<sup>42</sup> GCS Water and Environment (Pty) Ltd. (2020). Kareerand Tailings Storage Facility Expansion Project: Scoping Report

<sup>43</sup> Airshed Planning Professionals (2020). Air Quality Specialist Report for Mine Waste Solutions - Kareerand Expansion Project

Tim's Haven is one of the closest settlements to the site and is situated approximately 2.5 km to the east of the existing TSF. Based on the findings of the AQA, and the fact that the construction activities would be to the west of the existing facility, it is concluded that it is highly unlikely that these residents will be negatively affected by the construction activities. The same applies to Khuma township approximately 2 km to the north of the existing facility and Chubby Chicks chicken farm, approximately 6.5 km to the north east of the existing TSF.

## Noise

The area can, from a social perspective, be classified as an area with existing low ambient noise levels. Concentrated noise is currently generated at the existing Kareerand TSF with some additional noise created by industrial activities through the larger study area, as well as traffic from the R502 and further afield from traffic making use of the N12. The residential areas of Stilfontein and Khuma, as well as the rural sections within the area can also be described as relatively quiet.

Noise from the construction phase would mainly include noise from the operation of heavy machinery and the movement of construction related vehicles. Noise levels on-site will increase, with lower increases at off-site locations and/or where sensitive receptors are situated. These increased levels will be intermittent and of a short duration. It is anticipated that residents of Khuma or Tim's Haven and those to the south of the Vaal River would not be negatively affected by any increase in noise due to the distance of these residential areas to the proposed expansion site.

To limit noise pollution and to prevent possible exceedances above any stipulated thresholds, mitigation measures must be implemented.

**Table 19: Increase in Nuisance Factors**

<b>THEME: Increase in Nuisance Factors</b>		
	<b>Without mitigation</b>	<b>With mitigation / enhancement</b>
<b>Status</b>	Negative (-)	Negative (-)
<b>Severity</b>	3	2
<b>Spatial Scale</b>	3	3
<b>Duration</b>	3	3
<b>Frequency of activity</b>	4	4
<b>Frequency of impact</b>	3	2
<b>Legal Issues</b>	5	5
<b>Detection</b>	4	3
<b>Impact rating</b>	Medium (144) -	Medium (112) -
<b>Mitigation:</b>		
<ul style="list-style-type: none"> <li>MWS should continue to inform the Local Municipalities, community representatives and affected stakeholders of the proposed construction schedule and development plan through various forums including the forums stipulated by the Environmental authorisation application process</li> <li>MWS to communicate openly and frequently with the Local Municipalities, community representatives and affected stakeholders to ensure they are informed about activities that will generate nuisance factors</li> </ul>		

<ul style="list-style-type: none"> <li>• The existing Emergency Management Plan should be amended to include the expansion. It would be important to regularly review the functionality and efficiency of such a plan in conjunction with the local emergency teams, MWS management and affected communities as well as neighbouring landowners</li> <li>• The mitigation measures of the Acoustic Impact Assessment should be implemented</li> <li>• Dust suppression methods and a dust management plan as recommended in the Air Quality Assessment should be strictly implemented as required</li> <li>• All construction vehicles should be in a good condition and adhere to road worthy standards</li> <li>• Maintenance of vehicles and machinery should be done regularly</li> <li>• Limit construction hours to daylight day hours e.g. 6 am to 6 pm</li> <li>• Dust creation should be kept to the minimum by adhering to the speed limits on the gravel roads</li> <li>• Concurrent rehabilitation to be undertaken e.g. establishment of vegetation or covers (where feasible) to assist with dust suppression</li> <li>• Reclamation of other tailings could assist in minimising scattered dust pollution from various sources throughout the study area</li> <li>• Concerning health issues, MWS should closely liaise with the representatives of the Local Municipalities and Local and Provincial Health Departments to jointly develop solutions to some of the community health issues and improvement to basic health care services and infrastructure. Such liaison could discuss which assistant role MWS could play in this regard</li> </ul>
<p><b>Cumulative impacts:</b></p> <ul style="list-style-type: none"> <li>• Existing industrial activities in the area acting as additional sources of traffic, dust and noise pollution</li> <li>• Other mining activities in the area not related to the TFS (e.g. north of the N12)</li> <li>• Proposed Buffels Solar Energy Project – if the construction phases run concurrently</li> </ul>
<p><b>Residual impacts:</b></p> <ul style="list-style-type: none"> <li>• None anticipated</li> </ul>

**Expected areas of impact:** On-site, local area surrounding site (noise), possibly south of site (dust), along pipelines and at pump stations

**Expected cumulative impacts:** Proposed mining projects and solar facility could increase the intrusion impacts in the larger area.

## 8. SOCIO-ECONOMIC IMPACTS DURING OPERATIONS

### 8.1 Description of the Operational Phase

The expansion of Kareerand will enable the project to expand its operational lifespan from the current 2025 up to 2042, i.e. with an additional 17 years. The activities of the extended lifespan will continue as before with high pressure water cannons used to slurry the tailings on source TSFs. The slurry is then pumped by a number of pump stations and pipelines to the MWS/Chemwes Processing Plant, and the residues from the Processing Plants are pumped to the Kareerand TSF. Once an old Source TSF has been completely recovered, the objective is to clean it up and rehabilitate the site. Eleven source TSFs will be processed and disposed on Kareerand TSF should the expansion continue. These TSFs are situated to the west of the existing Kareerand TSF, south of Stilfontein and near Orkney.

The Source TSFs include the following:

- Harties TSFs (TSF 1, 2, 5, 6 and 7) located to the north of the R502 and south of Stilfontein and the N12. These are between 10km and 17 km from the existing Kareerand TSF;
- West Extension TSF and West TSF Complex which are both situated in close proximity to Orkney. The West TSF Complex is to the north east of Orkney with the West Extension TSF a bit further to the east of the West TSF. Both complexes are located to the north of the R502 and east of the R30/Oliver Tambo Drive and are between 16 and 19 km west from the existing Kareerand TSF;
- South East TSF situated to the north of R502 and south of the Harties TSF. The South East TSF is approximately 12 km west from the existing Kareerand TSF;
- The East TSF situated to the south of the South East TSF and the R502, also approximately 12 km west from the existing Kareerand TSF;
- Buffels 1 TSF and Buffels 5 TSF south of the R502 and west of the S643, approximately 8 km west of the existing Kareerand TSF; and
- Nicolor Gold Plant situated to the west of the S643 and approximately 7 km to the west of the existing Kareerand TSF.

### 8.2 Continuation of job and income opportunities

For purposes of the assessment it is assumed that the expansion will result in the continuation of the activities on the same level that was experienced the last 5 years. Based on figures for Kareerand operations for 2019, the total workforce (including workers on the source TSFs and processing plant) could currently be in the region of 949 workers with close to R1bn income per annum (salaries, wages, profits, rents, interest) created as a result of the project. The labour figures include the labour at the reclamation sites, MWS processing plant, administration and Kareerand TSF. It includes 495 permanent workers and 454 contract workers.

As indicated in Table 20 below, the flow-on impacts through supply and induced spending could have created an additional 2,200 jobs and some R1.2bn of flow-on income, i.e. a total of around 3



200 jobs and more than R2bn income. This represents about 4% of total formal employment and 7% of the GVA of the City of Matlosana. This is a very high contribution for any single project. However, the actual impact on the local economies of CMLM and JB Marks LM could be expected to be significantly lower.

Even if 97% of direct employment at the TSF is sourced from the local area, only 18% of current supply spending is spent on local (CMLM and JB Marks LM) suppliers. This means that only 42% of the total jobs or close to 1,300 mainly unskilled and semi-skilled jobs is possibly sourced from CMLM and JB Marks LM.

Of the R2bn in total value added (direct and flow-on) per annum anticipated for the project only 20% (R430 million) per annum is estimated to flow to the local economies of CMLM and JB Marks LM. This is based on the assumption that no profits will be retained in the local (municipal) area and that 18% of supply spending is spent within the local area. Spending on BEE suppliers (more than 50% ownership) represents some 73% of total procurement spending.

**Table 20: Potential direct and flow-on impacts of the Project during the operational phase**

R million (2019 prices)	Averages per annum estimates 2025 – 2042
Direct GVA	940
Direct employment at mine	949
% unskilled	60%
% semi-skilled	34%
% skilled	6%
% unskilled workers sourced from local area	100%
% medium skilled workers sourced from local area	94%
% high skilled workers sourced from local area	72%
Flow-on GVA	1,166
Flow-on employment	2,200
<b>Total GVA</b>	<b>2,105</b>
<b>Total employment</b>	<b>3,349</b>
<b>GVA in CMLM and JB Marks LM (%)</b>	<b>20%</b>
<b>Total employment from CMLM and JB Marks LM (%)</b>	<b>30%</b>

**Source:** Based on information from AGA (2020); Stats SA (2017 and 2019), Bhorat and Rooney (2017), Reddy et.al. (2016)

Based on the remuneration of the different skill categories, some 569 (60%) of the reclamation jobs could be unskilled (requiring less than matric); 323 (34%) semi-skilled (requiring matric or equivalent) and 54 (6%) skilled (requiring post matric qualifications).

A skills development plan is recommended (if not yet in place). Such a programme could include functional literacy and numeracy programmes, career progression plans, up-skilling for hard to fill vacancies and management positions, bursary and internships and portable skills training.

The significance of impacts associated with the employment and income generation is assessed in Table 21 below.

**Table 21: Employment and Income Generation Impact Assessment**

<b>THEME: Local employment and income impact</b>		
	<b>Without mitigation</b>	<b>With mitigation / enhancement</b>
<b>Status</b>	Positive (+)	Positive (+)
<b>Severity</b>	3	4
<b>Spatial Scale</b>	4	4
<b>Duration</b>	4	4
<b>Frequency of activity</b>	5	5
<b>Frequency of impact</b>	4	4
<b>Legal Issues</b>	1	1
<b>Detection</b>	1	1
<b>Impact rating</b>	Medium (121) +	Medium (132) +
<p><b>Enhancement:</b></p> <ul style="list-style-type: none"> <li>• Prioritise local labour in the recruitment process as part of the company's own recruitment policy or as part of contractor management plan</li> <li>• The objective should be to reach 100% recruitment of additional/ new unskilled labour from local communities</li> <li>• Continue to provide skills development opportunities for employees</li> <li>• Develop a database of goods and services that could potentially be outsourced to the local community</li> <li>• Establish a supplier development programme. The programme should focus on small businesses in CMLM and JB Marks LM that could supply to the project (e.g. catering and cleaning) as well as larger businesses within the region.</li> <li>• If not yet in place, put a contractor management plan (including direct service providers) in place to ensure that the local employment and procurement targets of the operations are met.</li> <li>• A transparent communication strategy should be followed to inform the local communities of these targets and report on progress on these targets</li> </ul>		
<p><b>Cumulative impacts:</b></p> <ul style="list-style-type: none"> <li>• Other mining activities in the area not related to the TFS (e.g. north of the N12)</li> </ul>		
<p><b>Residual impacts:</b></p> <ul style="list-style-type: none"> <li>• Up-skilled labour force (positive)</li> </ul>		

**Expected areas of impact:** CMLM, JB Marks LM and adjacent North West, Free State and Gauteng regions.

**Expected cumulative impacts:** Other mines operational in the local area.

### **8.3 Impact on poverty through employment**

As illustrated above, close to 60% of the workers employed directly by MWS are currently unskilled. If the skills distribution stays the same, MWS by investing in the Kareerand TSF expansion project could continue to provide employment for approximately 569 in the unskilled labour category. Flow-on opportunities potentially add another 442 jobs for unskilled workers through spending in suppliers and induced impacts from income and spending of Kareerand workers and workers of their suppliers.

Assuming an average household size of 3.3 people per low-income household, these unskilled workers could support close to 3,337 people living in low household incomes over the 17-year LoM as illustrated in Table 22 below. If 30% of the unskilled labour is sourced from the local area this could support close to 1,000 low income households (300 employees supporting 3.3. household members) in CMLM and JB Marks LM representing about 0.4% of the 270 000 people living in poverty in CMLM and JB Marks LM.

**Table 22: Potential impact on low income households during the operational phase**

R million	Averages per annum estimates 2025 – 2042
Unskilled labour direct (number)	569
Unskilled labour flow-on (number)	442
Total unskilled labour	<b>1,011</b>
Number of people living in poor households that could be supported	<b>3,337</b>

**Source:** Based on information from AGA (2020); Stats SA (2017 and 2019), Bhorat and Rooney (2017), Reddy et.al. (2016)

The impact on poverty reduction is assessed in Table 23.

**Table 23: Poverty Reduction Impact Assessment**

<b>THEME: Poverty reduction through employment</b>		
	<b>Without mitigation</b>	<b>With mitigation / enhancement</b>
<b>Status</b>	Positive (+)	Positive (+)
<b>Severity</b>	1	2
<b>Spatial Scale</b>	4	4
<b>Duration</b>	4	4
<b>Frequency of activity</b>	5	5
<b>Frequency of impact</b>	4	4
<b>Legal Issues</b>	1	1
<b>Detection</b>	1	1
<b>Impact rating</b>	Medium (99) +	Medium (110) +
<b>Enhancement:</b>		
<ul style="list-style-type: none"> <li>• Prioritise local labour in the recruitment process as part of the company's own recruitment policy or as part of contractor management plan</li> <li>• The objective should be to reach 100% recruitment of additional/ new unskilled labour from local communities</li> </ul>		
<b>Cumulative impacts:</b>		
<ul style="list-style-type: none"> <li>• Other mining activities in the area not related to the TFS (e.g. north of the N12)</li> </ul>		
<b>Residual impacts:</b>		
<ul style="list-style-type: none"> <li>• None</li> </ul>		

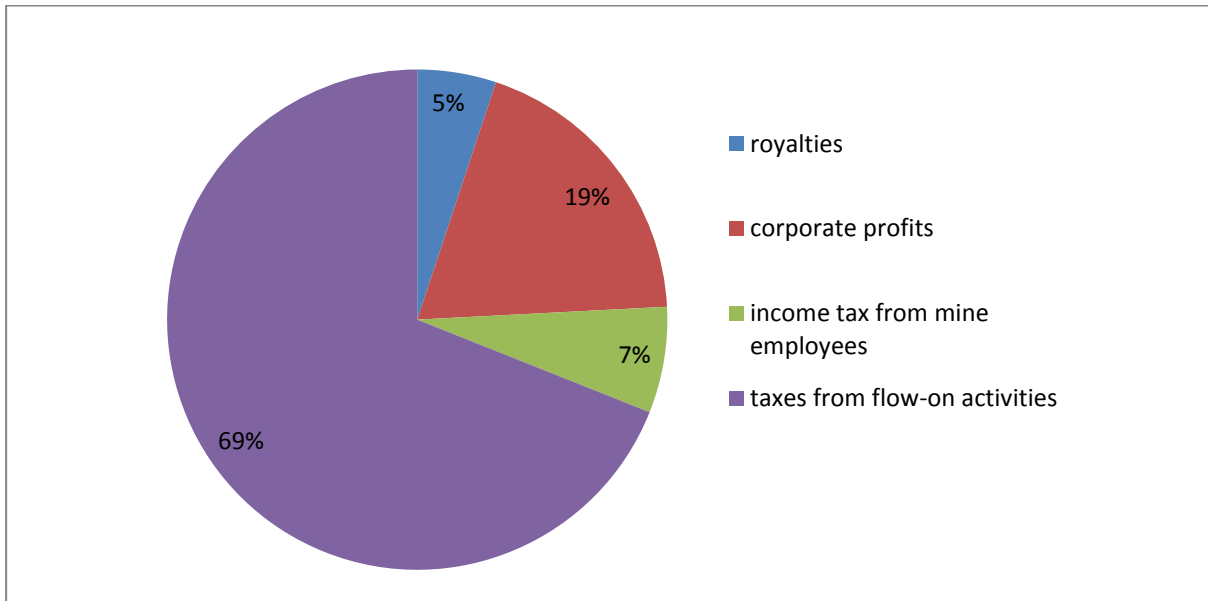
**Expected areas of impact:** CMLM, JB Marks LM and adjacent North West and Gauteng regions.

**Expected cumulative impacts:** Other mines operational in the local area.

## 8.4 Continuation of generation of public revenues

Based on its performance in the past, the expanded Kareerand TSF is expected to generate some R 8 billion (2019 terms) in tax income over its 17 years in operations, i.e. an average of more than R 470 million per annum. This represents about 22% of the GVA (direct and flow-on) anticipated from the project. This contribution is average compared to the average tax: GVA ratio for the national economy of 26% in 2018 – a ratio that is already considered high compared to a global average of 16%.

Figure 8 below shows the high contribution made by taxes (direct and indirect) from flow-on activities.



**Figure 8: The distribution of different types of taxes to total tax revenues from the Project**

**Source:** Based on information from AGA (2020); Stats SA (2017 and 2019), Bhorat and Rooney (2017), Reddy et.al. (2016)

The impact on tax revenue is assessed in Table 24 below.

**Table 24: Public Revenue Impact Assessment**

<b>THEME: Public Revenue Impact</b>		
	<b>Without mitigation</b>	<b>With mitigation / enhancement</b>
<b>Status</b>	Positive (+)	Positive (+)
<b>Severity</b>	3	3
<b>Spatial Scale</b>	5	5
<b>Duration</b>	4	4
<b>Frequency of activity</b>	3	3
<b>Frequency of impact</b>	5	5
<b>Legal Issues</b>	5	5
<b>Detection</b>	3	3
<b>Impact rating</b>	High (192) +	High (192) +

<b>Enhancement:</b>
• None
<b>Cumulative impacts:</b>
• None
<b>Residual impacts:</b>
• None

**Expected areas of impact:** National economy.

**Expected cumulative impacts:** None.

### 8.5 Increased economic concentration of the local economy

For the stability of local output in an economy, it makes sense to have a more diversified economic base, thereby mitigating the effect of exposure to external variables usually influencing a specific sector, e.g. international commodity prices in the case of the mining sector. Due to the large exposure of the local economy towards mining output however, one could expect the mining sector cumulatively to have some destabilising influence on local output levels and could restrict the local adjustment process towards a post-mining economy. The impact on economic diversity is assessed in Table 25.

**Table 25: Impact on Economic Diversity**

<b>THEME: Economic diversity</b>		
	<b>Without mitigation</b>	<b>With mitigation / enhancement</b>
<b>Status</b>	Negative (-)	Negative (-)
<b>Severity</b>	4	3
<b>Spatial Scale</b>	4	4
<b>Duration</b>	4	4
<b>Frequency of activity</b>	4	4
<b>Frequency of impact</b>	4	4
<b>Legal Issues</b>	1	1
<b>Detection</b>	2	2
<b>Impact rating</b>	Medium (132) -	Medium (121) -
<b>Mitigation:</b>		
<ul style="list-style-type: none"> <li>• Focus the local procurement programme on non-core mining inputs (e.g. catering, accommodation)</li> <li>• Focus on the support of non-mining related activities in community development programmes and business support programmes</li> <li>• Focus on up-skilling and portable skills for the unskilled workforce of Kareerand. Align the portable skills programme to local, provincial and national skills shortages</li> </ul>		
<b>Cumulative impacts:</b>		
<ul style="list-style-type: none"> <li>• Other mining activities in the local area</li> </ul>		
<b>Residual impacts:</b>		
<ul style="list-style-type: none"> <li>• None</li> </ul>		

**Expected areas of impact:** The CMLM and JB Marks LM

**Expected cumulative impacts:** Other mines and agricultural activities in the local area increase the vulnerability of the local area in terms of external factors such as weather patterns and international commodity prices and could increase fluctuations in economic output in the local area.

## 8.6 Increased resource use

The mining and related sectors are highly energy intensive relative to its economic output. While water consumption at mining –related activities are relatively low compared to its output and compared to, say, the consumption of the agricultural sector, the scale of the operation is a factor in terms of its water consumption.

In the case of MWS both the energy and water intensity are very high compared to the value of output. As indicated in Table 26 below, MWS only produce R127 of GVA for every cubic metre of water used and only R5 worth of GVA for every kWh used, i.e. much lower than averages for the national economy in general. The project is still more water efficient than the agriculture sector but the sheer scale of the project means that a large volume of water is consumed, i.e. some 4 million cubic metres in 2019. Some 65% of the process water is however re-used and recycled and the rest mainly comes from Margaret Shaft. In terms of electricity the project used 195 million kWh in 2019.

**Table 26: Energy and Water Efficiency of Kareerand TSF, 2019**

Area	GVA (R) /cubic meter water used	GVA (R)/kWh used
National economy	207	29
National mining sector	518	28
National agricultural sector	8	31
Kareerand TSF	127	5

Source: Department of Energy (2018), Conningarth (2019), Stats SA (2017)

The impact on increased resource use is assessed in Table 27 below.

**Table 27: Impact on Increased Resource Use (Water and Energy)**

THEME: Increased resource use (water and energy)		
	Without mitigation	With mitigation / enhancement
Status	Negative (-)	Negative (-)
Severity	3	2
Spatial Scale	4	4
Duration	4	4
Frequency of activity	4	4
Frequency of impact	5	5
Legal Issues	5	5
Detection	1	1
Impact rating	Medium (165) -	Medium (150)-

**Mitigation:**

- MWS to continue with resource saving strategies in a resource use plan to continue minimising the project's energy and water use as far as practicable
- Prioritise support the development of renewable energy strategies (e.g. waste to energy) in the local municipal areas through the local social development plan

**Cumulative impacts:**

- Other mining activities in the local area

**Residual impacts:**

- None

**Expected areas of impact:** The CMLM and JB Marks LM

**Expected cumulative impacts:** Other mining and agricultural activities place additional pressure on energy and water resources in the local area.

### 8.7 Potential loss of income for businesses and households due to externalities

External costs constitute a market failure and arise from an economic activity that impose costs on people not engaged in the economic activity and are not reflected fully in operational prices of the enterprise. In the case of tailings storage facilities and associated infrastructure these costs are mainly absorbed by local communities adjacent to the site.

The potential risks for external costs related to environmental degradation caused by the expanded Kareerand TSF is contained in the respective studies for the environmental authorisation under this EIA and include assessments of the impacts of the project on ground water availability and quality, air quality, sense of place through visual impacts and the degradation of soil and land capability.

Based on these studies, the following parties could be potentially affected by environmental-related externalities:

- According to the geohydrology (groundwater) impact report the sulphate underground plume (if unmitigated) could spread with a high potential impact on the water quality of the farming communities to the south-west and east of the Kareerand TSF along the northern banks of the Vaal River. Various mitigation measures (e.g. lining the expanded TSF area, comprehensive ground monitoring system, bigger return water dam, 60 year plus plume management and 25 to 60 interception boreholes) are recommended to be applied to the existing and proposed TSF. These mitigation measures are expected to reduce the risk of groundwater contamination to medium or low. With these mitigation measures in place, the seepage levels to the Vaal River are expected to increase sulphates and Total Dissolved Solids (TDS) with between 5mg/l and 10 mg/l and even at peak periods should still result in sulphate levels significantly below the upper bounds that could affect animal or human health<sup>44</sup> No farm boreholes to the south and/or east at risk;

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<sup>44</sup> Research found that In livestock watering sulphate levels above 250 mg/l suppress copper and selenium which result in poor fertility and condition (FSE, 2018). According to the geo-hydrology report, current levels in Vaal River areas in the vicinity of the project vary between 50mg/l and 200 mg/l.

- According to the hydrology impact assessment report, there are high risks associated with potential pipeline failures and the TSF overtopping or failing if left unmitigated. These risks could impact on the water quality of communities along the pipelines, the Koekemoerspruit as well the communities on the south-west of the Kareerand TSF along the northern and southern banks of the Vaal River. The report maintains that these risks will be reduced to medium if the proposed mitigation management measures are adhered to;
- External costs for the tourism sector are expected to be very low apart from two small establishments (Wawielpark and Clementia Wedding and Conference Venue) situated on the south bank of the Vaal River south west of the TSF. Any negative impact of the TSF on the water quality of the Vaal River would also have a negative impact on these facilities. As discussed above, the risks related to groundwater pollution impacting on the Vaal River is considered a low risk by the specialist study if mitigation measures are effectively implemented;
- The air quality model does not predict any particle matter or dust fall-out rates to exceed the permissible limits to safeguard human health. The dominant wind direction in the area is from a north westerly direction. This means that the Khuma community is upwind from the facility and according to the report at low risk for dust fall-out or particle matter. Not even the higher risk areas to the east and south east of the TSF (including Tim's Haven) are at risk of dust fall-out levels exceed 400 mg/m<sup>2</sup>-day, the lower standard that applies to potential harmful effects on livestock<sup>45</sup>;
- Certain property owners close to the TFS could be at risk in terms of the devaluation of their properties due to soil degradation, ground or surface water pollution or a loss of sense of place due to visual impacts:
  - As discussed above, the geohydrology and hydrology reports report identified the farming communities to the south-west of the Kareerand TSF along the banks of the Vaal River as well as to the east of the TSF as high risk receptors of pollution if left unmitigated but low to medium risk if properly managed
  - In terms of soil degradation, the specialist report did not identify any socio-economic receptors that would be at high risk. The study only identified risk areas on the expanded area of the TSF itself and excluded areas along the new or existing pipelines
  - Khuma and Stilfontein will be visually affected. Property prices in these and other adjacent areas are however unlikely to be affected on the ground of disturbance in the sense of place since the whole area is historically dominated by the mining industry. The specialist report also notes that as many old TSF's will be re-mined and rehabilitated in the process, thus reducing the visual impact of such TSFs.

The reclamation project could have significant positive spin-offs on the water quality of the Vaal River if it could reduce the salt load of the historic TSFs salt load into the area's dolomitic aquifers. For these positive environmental spin-offs of the TSF to materialise, the historic TSFs need to be sufficiently rehabilitated and for the Kareerand TSF not to replace the negative environmental impacts of the historic TSFs.

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<sup>45</sup> For impacts on human health dust fall-out limits for residential areas is set at 600 mg/m<sup>2</sup>-day and for non-residential areas at 1 200 mg/m<sup>2</sup>-day exceeded once at three sites



While the specialist studies rate the risks for externalities as medium to low after mitigation, there are concerns in terms of the historic performance of Kareerand TSF. These concerns are well documented in historic audit reports, media articles as feedback received in interviews with local stakeholders. Issues listed In the Environmental Legal Compliance Report<sup>46</sup> include:

- Soil degradation and water pollution due to spillages along the pipeline network<sup>47</sup>
- The lack of rehabilitation of areas affected by spillages
- Overflow of the return water dam<sup>48</sup>
- The dysfunctional state of interception boreholes at the time of some environmental audits.

Another concern is capacity constraints on national and local government level in terms of managing the environmental impacts within the Integrated Vaal River System (discussed in Section 5.4.7 above).

There are also information gaps that cause uncertainty in terms of the overall assessment of environmental risks for local communities close to Kareerand TSF. These include:

- The unknown impact on soil and water quality in the case of potential spillages along the along the new or existing pipelines (the specialist studies focuses on the TSF area and not the supporting infrastructure) ;
- The status and impacts of the rehabilitation of the historical TSFs are unknown;

Based on the institutional concerns related to the monitoring and management of project-related impacts the residual environmental costs to the local communities close to the expanded Kareerand TSF could be high. To lower the risks (as well as uncertainties around these risks) and improve the project's 'social license to operate' in the local area the following is recommended.

- Expand the current community forum into Environmental Management Working Group that incorporates an external ombudsman function to monitor compliance and provide advice on the implementation of Environmental Management Plan (EMP). The working group should consist of an independent representative NGO with capacity and that has experience and trust in the local area, local community representatives from Khuma, Stilfontein and surrounding farms (not benefiting or seeking gain from the project through employment or procurement), representatives from JB Marks and CLML and representatives from the DMR, DEA and DWS.
- The existing Emergency Management Plan should be reviewed and amended to include the proposed project. It would be important to review the functionality and efficiency of such a plan in conjunction with the local emergency teams, MWS management and affected communities as well as neighbouring landowners.
- The inclusive group above should meet regularly with access (compliant to safety regulations) to members to the relevant sites if needed.

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<sup>46</sup> AGA (2016). Environmental Legal Compliance Report

<sup>47</sup> The 2014 Annual Report submitted to the DWS reflected a number of spillage incidents involving pumps and/or pipeline

<sup>48</sup> On 21 February 2017 following a heavy rainstorm the return water dam at Kareerand overflowed into the drainage line and subsequently discharged downstream into the Vaal River resulting in Total Dissolved Solids (TDS) and Sulfate exceeding the regulatory in-stream water quality objectives.

**Table 28: Impact on External Costs to Local Communities**

<b>THEME: Environmental Externalities</b>		
	<b>Without mitigation</b>	<b>With mitigation / enhancement</b>
<b>Status</b>	Negative (-)	Negative (-)
<b>Severity</b>	4	3
<b>Spatial Scale</b>	3	3
<b>Duration</b>	5	4
<b>Frequency of activity</b>	3	3
<b>Frequency of impact</b>	4	4
<b>Legal Issues</b>	5	5
<b>Detection</b>	3	3
<b>Impact rating</b>	<b>High (180) -</b>	<b>Medium (150) -</b>
<p><b>Mitigation:</b></p> <ul style="list-style-type: none"> <li>• Implement mitigation as per the mitigation measures of the respective specialist studies (geohydrology, air quality)</li> <li>• Expand the current community forum into an Environmental Management Working Group to monitor compliance and provide advice on the implementation of Environmental Management Plan (EMP). It is recommended that such a working group could consist of an independent representative NGO that has experience and trust in the local area, local community representatives from Khuma, Stilfontein and surrounding farms (not benefiting or seeking gain from the project through employment or procurement), representatives from JB Marks and CLML and representatives from the DMR, DEA and DWS.</li> <li>• Update a disaster management plan in terms of floods, spillages etc. and water quality in collaboration with the Environmental Management Working Group;</li> <li>• The group should meet regularly with access to members (compliant to safety regulations) to the relevant sites if needed</li> </ul>		
<p><b>Cumulative impacts:</b></p> <ul style="list-style-type: none"> <li>• Other mining activities in the local area; historic tailings facilities that are being reclaimed, the TSF's current and planned infrastructure (pump stations and pipelines)</li> </ul>		
<p><b>Residual impacts:</b></p> <ul style="list-style-type: none"> <li>• None</li> </ul>		

**Expected areas of impact:** The CMLM and JB Marks LM

**Expected cumulative impacts:** Other mining activities in the local area; historic tailings facilities that are being reclaimed, the TSF's current and planned infrastructure (pump stations and pipelines) could increase the anticipated impacts of the expanded Kareerand TSF.

## 8.8 Sense of place

The social impact associated with the impact on the sense of place relates to the change in the landscape character and permanent visual impact of the proposed project. The visual impact of the proposed expansion of the Kareerand TSF was assessed as part of the Visual Impact Assessment. The following should thus be read from a social perspective as the impact on the sense of place, but conclusions of the Visual Impact Assessment must also be acknowledged.

The study area surrounding the proposed TSF expansion can be described as an area where various disturbances to the natural environment occur and where mining has historically taken place. The former Buffelsfontein Mine Eastern Shaft and the proposed Buffelsfontein Solar Facility is situated to the west of the site.

The area has a typical infrastructural and industrial type character as there are various scattered tailings facilities, existing and old mine shafts, power line infrastructure, erosion and degraded lands, some run down urban areas with disbanded buildings found in the area surrounding the Kareerand TSF and proposed expansion area. The area is further characterised by grasslands or natural veld, scattered farming activities (cattle farming and crop production), towns, roads, and other infrastructure associated with urban environments. The larger area forms part of the N12 Treasure Route. Even though there are some dispersed tourism attractions and facilities within the area, especially focused around the Vaal River, the area is, from a social perspective, not classified as an area with a high potential for tourism. This is mainly due to the general overall scenic quality and cultural or historical significance of the larger area and the lack of key tourist attractions in close proximity to the site.

One could argue that the residents in the area have already been impacted by the existing TSF facility and that some could have accepted the visual disturbances by the mining activities and the TSF on their sense of place and incorporated these in their daily living and movement patterns. It should further be noted that the expansion of the TSF will take place over time, resulting in a slow change in the characteristics of the area and the overall sense of place. The distance of residents from the facility and their individual perceptions, however, will have an influence on how the expansion of the TSF is perceived.

The main visual impacts associated with the existing TSF and the expansion of the TSF are to the north and south of the site. Due to the size and height of the existing TSF and the proposed expansion with an ultimate height of 122m and between 3.1 wide and 3.8km in length, as well as ancillary infrastructure, the project will have a significant visual impact with a potential Zone of Influence of 10 km. The facility will thus be clearly visible to e.g. Khuma township to the north, parts of Stilfontein to the northwest and Tim's Haven to the east, and possibly also at the Chubby Chick Chicken Farm to the northeast, Wawiel Park Holiday Resort and Clementia Wedding Venue (both to the south). The latter two facilities are situated to the south of the Vaal River, approximately 7km from the proposed expansion. The distance of these tourism facilities to the tailings facility, as well as the natural landscape around the Vaal River could mitigate the visual impact and therefore possibly preserve the existing sense of place in those areas.

Visitors to the area can be regarded as sensitive receptors. These visitors' focus might, in this case, shift from the Kareerand TSF and its expansion, to the other tailings facility and mining infrastructure found in the area. Visitors travelling within the larger area will thus have an intermittent view of the expansion. The Kareerand TSF will, however, be highly visible for motorists making use of the R502. It is unlikely that visitors focusing on the N12 Treasure Route would be significantly negatively impacted by the visual appearance of the Kareerand TSF and the expansion, mainly due to the distance from the facility, the intermittent viewpoints and the fact their focus would be on specific tourism related activities. Visitors to the tourism facilities to the south of the Vaal River (e.g. Wawiel Park Holiday Resort and Clementia Wedding Venue) make use of the

R502, S643 and Vermaasdrift Road to access these facilities. It is anticipated that the expansion of the TSF will be visible along the R502 and S643 and at certain points along the Vermaasdrift Road.

In view of the above discussion, it is noted that even though the visual impact of the expansion would be high, the overall impact of the visual disturbances on the sense of place is deemed moderate to low. This deduction is based on:

- The existing physical and visual characteristics of the general area;
- The possible difference in perceptions of the viewers and the fact that residents perceive the existing TSF as part of the current sense of place (based on interviews with community representatives);
- The distance of observers and/or sensitive receptors from the existing and expansion TSF; and
- The likelihood that the natural vegetation around the Vaal River would mitigate the impact of the tailings facility on the localised sense of place.

Positive impacts on the sense of place can also be experienced in the local areas within the larger study area where reclamation of other tailings facilities will be undertaken.

Noise associated with the operations at the tailings facility could furthermore impact the sense of place. The risks associated with possible negative impacts on the water quality and quantity and the possible dust pollution, as well as light pollution at night, however, could have the most significant negative impact on the sense of place for residents influenced by these impacts. This impact on the sense of place would be even more significant if the environmental impacts occur over a long period of time and cannot be mitigated or rectified. This can then have a spill-over effect on the tourism industry.

From a social point of view, it is concluded that the impact of the facility on the sense of place cannot be successfully mitigated especially with regards to the visual impact. It should however be aimed to lessen the negative impacts as far as possible through screening methods (e.g. planting of trees). The risks in terms of the impact on the water quality and quantity and possible negative environmental impacts would be the main influencing factors of the sense of place of the area. An environmentally sound development striving to maintain best international practice in terms of the environmental management of the facility will reduce possible negative impacts on the sense of place.

**Table 29: Sense of Place**

<b>THEME: Sense of Place</b>		
	<b>Without mitigation</b>	<b>With mitigation / enhancement</b>
<b>Status</b>	Negative (-)	Negative (-)
<b>Severity</b>	3	3
<b>Spatial Scale</b>	3	3
<b>Duration</b>	5	4
<b>Frequency of activity</b>	5	5
<b>Frequency of impact</b>	3	3
<b>Legal Issues</b>	5	5

<b>Detection</b>	2	2
<b>Impact rating</b>	Medium (165) -	Medium (150) -
<b>Mitigation:</b> <ul style="list-style-type: none"> <li>• The mitigation measures of the Visual Impact Assessment should be implemented</li> <li>• Concurrent rehabilitation to be undertaken where feasible</li> <li>• Re-vegetation of side slopes to be undertaken as soon as feasible</li> <li>• Screening (e.g. planting of trees) to be implemented where feasible and required</li> <li>• The design should limit the surface area footprint as far as possible and should attend to the side slope configuration to lessen impacts;</li> <li>• Environmental management of the facility must adhere to environmental regulations and strive towards international best practice</li> </ul>		
<b>Cumulative impacts:</b> <ul style="list-style-type: none"> <li>• Other mining activities in the local area; historic tailings facilities that are being reclaimed, the TSF's current and planned infrastructure (pump stations and pipelines)</li> </ul>		
<b>Residual impacts:</b> <ul style="list-style-type: none"> <li>• Visual impact of the tailings and the residual impact on the sense of place</li> <li>• Environmental risks possibly impacting on the sense of place</li> </ul>		

**Expected areas of impact:** The Kareerand TSF expansion site, pump stations sites and pipelines and surrounding areas

**Expected cumulative impacts:** Other mining activities in the local area; historic tailings facilities that are being reclaimed, the TSF's current and planned infrastructure (pump stations and pipelines) could increase the anticipated impacts of the expanded Kareerand TSF.

## 8.9 Nuisance factors

### Traffic Movement

The total vehicle fleet is anticipated to remain the same as for the existing TSF. Additional vehicles could be used if concurrent rehabilitation will be undertaken. As the vehicles will operate on site and due to the distance of the residential areas to the expansion site, the noise and intrusions impacts associated with the movement of these vehicles are considered to be low.

### Dust

Dust will be created by the movement of waste material, the movement of vehicles and the operation of mechanical equipment. Windblown dust from the tailings facility during the operational phase will vary according to the season, with possible higher levels and frequency during the windy months. The dust pollution can be a nuisance factor to nearby communities and can impact negatively on the vegetation, as well as on the cultivation of and quality of crops.

The findings of the Air Quality Assessment indicated that, during the operational phase, the impact of dust pollution (particulate matter concentrations such as PM10 and PM2.5 concentrations) are within compliance off-site and at all the sensitive receptors over the short- and long-term. Environmental and safety concerns must be addressed to promote the sustainability of the land and the health and safety of individuals (especially those with already compromised health issues (e.g. TB sufferers), young children and the elderly) around the expanded Kareerand TSF. It is critical to avoid any possible health safety risks and to address any possible concerns from

residents in future (e.g. if dust is experienced as a nuisance and if dust impacts on the quality of life of residents).

**Noise**

As previously indicated, the area can, from a social perspective, be classified as an area with existing low ambient noise levels. The activities at the existing TSF create on-site noise with limited impacts off site. Noise levels will increase with the expansion of the TSF and will mainly be from the operating of pumps, heavy vehicles and the movement of workers. The level of noise will differ at different operating times.

Potentially sensitive receptors were identified with the closest potential receptors being Khuma residential area to the north, the Tim’s Haven area to the east of the existing site along the Vaal River, and residential pockets to the south of the Vaal River. The Acoustic Impact Assessment found that the projected operational noise levels at Khuma will slightly increase during the operations (daytime hours) although the increase would be so negligible that no to little community responses are expected. Marginal increases are also anticipated during night-time. The noise increase is further not anticipated to reach to the east of the site near the Vaal River and therefore no impacts are anticipated for Tim’s Haven and other property owners to the south of the Vaal River.

It is thus anticipated that noise annoyance levels will be relatively low and that the ambient noise levels would not change significantly. Therefore no noise complaints would be expected.

The main nuisance factors from a social perspective thus relate to the possible dust impacts with subsequent health risks. The rating below is thus based on this risk and nuisance factor with the highest rating levels.

**Table 30: Nuisance Factors**

<b>THEME: Nuisance Factors</b>		
	<b>Without mitigation</b>	<b>With mitigation / enhancement</b>
<b>Status</b>	Negative (-)	Negative (-)
<b>Severity</b>	3	2
<b>Spatial Scale</b>	3	3
<b>Duration</b>	4	4
<b>Frequency of activity</b>	3	3
<b>Frequency of impact</b>	3	3
<b>Legal Issues</b>	5	5
<b>Detection</b>	3	3
<b>Impact rating</b>	Medium (140) -	Medium (126) -
<p><b>Mitigation:</b></p> <ul style="list-style-type: none"> <li>• MWS must continue to communicate openly and frequently with the Local Municipalities, community representatives and affected stakeholders to ensure they are informed about activities that will generate nuisance factors. This can be done through the proposed Environmental Management Working Group</li> <li>• A grievance mechanism must be put in place and all stakeholders should be made aware of the processes to access and implement the grievance mechanism</li> </ul>		

- The mitigation measures of the Acoustic Impact Assessment should be implemented
- Dust suppression methods as recommended in the Air Quality Assessment should be strictly implemented as required
- The approved dust management plan should be amended to incorporate the TSF expansion
- On-going dust fall out monitoring must be undertaken to monitor emissions from the project
- Minimise noise impacts and implement all mitigation measures as specified in the relevant specialist Acoustic study
- All vehicles should be in a good condition and adhere to road worthy standards
- Maintenance of vehicles and machinery should be done regularly
- Limit operational hours to normal daytime hours 6 am to 6 pm.
- Dust creation should be kept to the minimum by adhering to the speed limits on the gravel roads
- Concurrent rehabilitation to be undertaken e.g. re-establishing of vegetation or covers (where feasible) to assist with dust suppression
- Reclamation of other tailings could assist in minimising scattered dust pollution from various sources throughout the study area

**Cumulative impacts:**

- Existing industrial activities in the area acting as additional sources of traffic, dust and noise pollution
- Other mining activities in the area not related to the TFS (e.g. north of the N12)

**Residual impacts:**

- Health risks
- Environmental pollution risks

**Expected areas of impact:** The Kareerand TSF site, pipelines and pump stations and surrounding areas

**Expected cumulative impacts:** Existing industrial activities in the area acting as additional sources of traffic, dust and noise pollution; Other mining activities in the area not related to the TFS (e.g. north of the N12) causing intrusion impacts, health risks and possible environmental pollution.

**8.10 Community Safety**

**Safety**

Safety concerns relate to the possible risk of failure of a TSF have been discussed under Section 8.7 above.

Illegal mining in the area causes a threat to the environment and poses safety risks to residents and landowners due to illegal miners being involved in criminal activities and causing damage to mining related infrastructure. Specific concerns were raised with regards to illegal miners damaging water pumps and pipelines. It is therefore critical that safety controls and measures are put in place to avoid illegal miners to access the TSF site, as well as cause damage to pump stations and pipelines of MWS.

**Health risks and concerns**

Community members are concerned about their frequent exposure to airborne particulate matter associated with wind erosion of the existing and expanded Kareerand TSF. The dust can contain fine particulate matter, which can be inhaled, causing unhealthy respiratory conditions. Dust can furthermore contain hazardous substances and some levels of radioactive material. Community representatives from Khuma indicated that they frequently receive complaints regarding respiratory

disease conditions. The dust from the expanded Kareerand TSF can pose a significant health risk and reduce the quality of life for residents in the area. Dust containing radioactive material can furthermore pose risks to the water quality, the environment, wildlife, livestock and crop production. It can therefore also lead to negative impacts on properties with related loss in property values. The environmental risks and subsequent risk to the health and quality of life of the resident communities in the larger area will remain a concern. The expansion of the TSF can increase these risks.

However, the Health Impact Assessment and Radiological Impact Assessment indicated that there would be a medium to low increase in the risk. The Air Quality Assessment also indicated that short-term National Ambient Air Quality Standards (NAAQS) are not exceeded at any of the sensitive receptor areas. The dust pollution associated with the TSF expansion is thus “unlikely to be a significant risk to human health at the surrounding receptors”. From a social perspective this health-related risk is rated as medium as concerns regarding health risks among community members would remain.

**Impact on Environmental and Water Sources**

Soil and water contamination due to the presence of possible radioactive material and seepage are regarded as risk associated with TSF’s. The existing TSF has been in operation for approximately 8 years. During this period, two spillages occurred (2012 and 2013) which resulted in significant negative environmental impacts to the affected areas.

Boreholes in the area are still used as water source for livestock, for irrigation and even domestic use. Farm boreholes to the east, north-east and south-east of the proposed facility (approximately 4) can be seen as sensitive receptors and will thus be at risk if no mitigation is undertaken in the long term. If mitigation is fully implemented, the Hydrogeological Report indicated that there would be no risks to the boreholes to the east<sup>49</sup>.

Risks to the water quality of the Vaal River System due to the expansion project (low risk) and seepages from the current TSF are anticipated (medium risk). Areas to the south and southwest of the facility could be affected. The risk of seepage can mainly be minimised by the implementation of interception boreholes to the south and east of the expansion facility and to pump the return water to the MWS plant for treatment.

**Table 31: Community Safety**

<b>THEME: Community Safety</b>		
	<b>Without mitigation</b>	<b>With mitigation / enhancement</b>
<b>Status</b>	Negative (-)	Negative (-)
<b>Severity</b>	3	3
<b>Spatial Scale</b>	3	3
<b>Duration</b>	5	4

<sup>49</sup> Interpretations made from GCS (Pty) Ltd. (2020) Hydrogeological Assessment for the Kareerand TSF & Expansion Project



Frequency of activity	3	3
Frequency of impact	4	4
Legal Issues	5	5
Detection	3	3
Impact rating	Medium (165) -	Medium (150) -
<p><b>Mitigation:</b></p> <ul style="list-style-type: none"> <li>MWS must continue to communicate openly and frequently with the Local Municipalities, community representatives and affected stakeholders to ensure they are informed about activities that will have an impact on community health, and impacts on the environment. This can be done through the proposed Environmental Management Working Group</li> <li>The existing Emergency Management Plan should be amended to include the expansion. It would be important to regularly review the functionality and efficiency of such a plan in conjunction with the local emergency teams, MWS management and affected communities as well as neighbouring landowners</li> <li>Unauthorised access to the TSF site should be prevented. The area must have strict access control and must be fenced off.</li> <li>A grievance mechanism must be put in place and all stakeholders should be made aware of the processes to access and implement the grievance mechanism</li> <li>Adhere to mitigation measures of the Ground and Surface Water, Air quality, Health and Radiological Impact Reports</li> </ul>		
<p><b>Cumulative impacts:</b></p> <ul style="list-style-type: none"> <li>Existing industrial activities in the area acting as additional sources of traffic, dust and noise pollution</li> <li>Existing tailings facilities present in the larger study area</li> <li>Other mining activities in the area not related to the TFS (e.g. north of the N12)</li> </ul>		
<p><b>Residual impacts:</b></p> <ul style="list-style-type: none"> <li>Health risks</li> <li>Environmental pollution risks</li> </ul>		

**Expected areas of impact:** The Kareerand TSF site and surrounding area

**Expected cumulative impacts:** Existing industrial activities in the area acting as additional sources of traffic, dust and noise pollution; Other mining activities in the area not related to the TFS (e.g. north of the N12) causing health risks and possible environmental pollution.

## 9. SOCIO-ECONOMIC IMPACTS DURING DECOMMISSIONING AND POST-CLOSURE

### 9.1 Description of the Decommissioning Phase

During decommissioning all redundant infrastructure are dismantled and the final rehabilitation process commence. Only when the mine closure certificate is issued can the project finally close.

### 9.2 Job and income losses

The decommissioning and project closure will lead to loss of direct and flow-on jobs. This impact is assessed in the table below.

**Table 32: Job and Income Loss Impact Assessment**

<b>THEME: Job and Income Losses</b>		
	<b>Without mitigation</b>	<b>With mitigation / enhancement</b>
<b>Status</b>	Negative (-)	Negative (-)
<b>Severity</b>	4	3
<b>Spatial Scale</b>	4	4
<b>Duration</b>	4	4
<b>Frequency of activity</b>	5	5
<b>Frequency of impact</b>	4	4
<b>Legal Issues</b>	1	1
<b>Detection</b>	3	2
<b>Impact rating</b>	Medium (169) -	Medium (132) -
<b>Mitigation:</b>		
<ul style="list-style-type: none"> <li>Develop mechanisms to assist employees, prior to retrenchment date, in the transition phase after closure of the operations. This includes offering portable skilled development programmes during the operational phase of the project, providing assistance in accessing available and suitable jobs with other local mines or companies, providing positions during the Aftercare and rehabilitation phase etc.</li> <li>Focus on non-core related local supply links during the operational phase to facilitate easier transitioning of local suppliers to other industries</li> </ul>		
<b>Cumulative impacts:</b>		
<ul style="list-style-type: none"> <li>None</li> </ul>		
<b>Residual impacts:</b>		
<ul style="list-style-type: none"> <li>None</li> </ul>		

**Expected areas of impact:** Labour sending areas, including CMLM and JB Marks LM.

**Expected cumulative impacts:** None foreseen

### 9.3 Decrease on local economic development funds

MWS's commitment with regards to social and economic development is expected to decrease during the decommissioning and closure of the project. The risk exists that projects, most notably infrastructure projects, are dependent on the funding that they receive from MWS and that such projects will fail or cease to exist due to the decrease in funding. This impact is assessed in the table below.

**Table 33: Impact caused by the Termination of Social Funds**

<b>THEME: The termination of social funds</b>		
	<b>Without mitigation</b>	<b>With mitigation / enhancement</b>
<b>Status</b>	Negative (-)	Negative (-)
<b>Severity</b>	3	2
<b>Spatial Scale</b>	5	5
<b>Duration</b>	3	3
<b>Frequency of activity</b>	3	3

Frequency of impact	4	4
Legal Issues	1	1
Detection	3	3
Impact rating	Medium (121) -	Medium (110) -
<b>Mitigation:</b> <ul style="list-style-type: none"> <li>• Develop and implement an exit strategy of any social projects that was implemented during the operational phase well in advance (2 years) before closure of the Project: For example hand-over of projects that does not generate their own income to relevant organisations that can ensure sustainable implementation</li> <li>• Follow a clear communication strategy to inform the local community of arrangements made related to any social spending and project closure. The communication strategy should commence two years prior to project closure</li> <li>• It is recommended that social programmes should focus on projects that can become self-sufficient by generating own income, e.g. agricultural support programmes that train subsistence farmers in more advance agricultural practices.</li> <li>• Investments in infrastructure projects should be done in coordination with the relevant authority, e.g. classrooms at local schools should be undertaken along with the Department of Education who can take over maintenance once the project ceases to exist</li> </ul>		
<b>Cumulative impacts:</b> <ul style="list-style-type: none"> <li>• None</li> </ul>		
<b>Residual impacts:</b> <ul style="list-style-type: none"> <li>• None</li> </ul>		

**Expected areas of impact:** The CMLM and JB Marks LM

**Expected cumulative impacts:** None foreseen

#### 9.4 Permanent loss of agricultural and

The site that was selected for the expansion of Kareerand TSF is located directly west of the current Kareerand TSF covering an area of 615 ha. The land is owned by and leased from the community. The land capability ranges from moderate to poor-quality arable soils with areas of moderate to low economic potential. Some areas could be used for low and higher intensity grazing as well as the cultivation of crops.

Due to the nature of the activities at Kareerand TSF the land used for the TSF and infrastructure will most likely be permanently lost for agricultural purposes. The expansion footprint will add approximately 380 hectares to the current TSF, i.e. representing approximately 0.5% of the land used in the City of Matlosana for grazing and crops. According to the soil impact report relevant to this EIA, an annual income from cattle farming of close to R700 000 could be permanently loss due to the extended project. Depending on the business model (communal or corporate commercial) this income could support between 2 and 7 unskilled workers per year.

**Table 34: Impact due to Loss of Agricultural Land**

<b>THEME: Loss of land</b>		
	<b>Without mitigation</b>	<b>With mitigation / enhancement</b>
<b>Status</b>	Negative (-)	Negative (-)
<b>Severity</b>	3	3
<b>Spatial Scale</b>	1	1
<b>Duration</b>	5	5
<b>Frequency of activity</b>	5	5
<b>Frequency of impact</b>	4	4
<b>Legal Issues</b>	1	1
<b>Detection</b>	2	2
<b>Impact rating</b>	Medium (108) -	Medium (108) -
<b>Mitigation:</b> <ul style="list-style-type: none"> <li>Commence discussions with local community related to post-closure land-use. Final agreement with the representative community forum on the post-closure management will be needed before signing off on the project closure</li> <li>Formulate and implement an alternative land-use plan</li> </ul>		
<b>Cumulative impacts:</b> <ul style="list-style-type: none"> <li>None</li> </ul>		
<b>Residual impacts:</b> <ul style="list-style-type: none"> <li>None</li> </ul>		

**Expected areas of impact:** The site selected for the Kareerand TSF expansion (west of current site)

**Expected cumulative impacts:** None

## 9.5 Sense of place

Once operations cease and decommissioning start, the rehabilitation of the Kareerand TSF would have to be finalised. Specific low risk land-uses need to be identified in consultation with the local surrounding communities and landowners. At this stage no specific end-uses have been proposed but it should be noted that the physical features and design (slopes) would be the key factors in determining the final land-use identification and selection. The TSF will be rehabilitated to be stable and a non-polluting facility.

A positive impact on the overall sense of place could be achieved where other tailings within the larger study area would have been reclaimed and successfully rehabilitated. The mega tailings facility concentrated in one area would thus ultimately remain. This could have positive impacts should it be done successfully, without any negative impacts on the environment and with low risk end-uses of the reclaimed tailings whereby socio-economic benefits by the surrounding communities are gained.

The visual impact of the expanded Kareerand TSF with the subsequent impact on the sense of place will thus remain beyond the life of the operation. Negative impacts on the sense of place can

be mitigated by re-vegetating the area and rehabilitating the site and surrounding area to as close to its natural state as possible.

**Table 35: Sense of Place**

<b>THEME: Sense of Place</b>		
	<b>Without mitigation</b>	<b>With mitigation / enhancement</b>
<b>Status</b>	Negative (-)	Negative (-)
<b>Severity</b>	3	2
<b>Spatial Scale</b>	3	3
<b>Duration</b>	5	5
<b>Frequency of activity</b>	5	5
<b>Frequency of impact</b>	3	2
<b>Legal Issues</b>	1	1
<b>Detection</b>	2	2
<b>Impact rating</b>	Medium (121) -	Medium (100) -
<b>Mitigation:</b> <ul style="list-style-type: none"> <li>• The mitigation measures of the Visual Impact Assessment should be implemented</li> <li>• Concurrent rehabilitation to be undertaken</li> <li>• Re-vegetation of side slopes to be undertaken as soon as feasible</li> <li>• Screening (e.g. planting of trees) to be implemented where feasible and required</li> <li>• Removal of alien vegetation should be undertaken</li> <li>• The tailings facility must be stabilised to prevent erosion</li> <li>• The design should limit the surface area footprint as far as possible and should attend to the side slope configuration to lessen impacts</li> <li>• The final landform should be designed to be compatible to a low-risk the end-use</li> <li>• A low-risk end-use must be determined in consultation with the relevant authorities, landowners and community representatives</li> <li>• Rehabilitation and closure must ensure a low-risk end-use that is both practical and economical</li> <li>• Environmental management of the facility must adhere to environmental regulations and strive towards international best practice</li> </ul>		
<b>Cumulative impacts:</b> <ul style="list-style-type: none"> <li>• None</li> </ul>		
<b>Residual impacts:</b> <ul style="list-style-type: none"> <li>• Visual impact of the tailings and the residual impact on the sense of place</li> <li>• Environmental risks possibly impacting on the sense of place</li> </ul>		

**Expected areas of impact:** The Kareerand TSF expansion site and surrounds

**Expected cumulative impacts:** None

## 9.6 Nuisance factors during decommissioning and rehabilitation

### Dust

Decommissioning could entail the removal of infrastructure and re-vegetation of the site. Vehicle movement associated with this phase would be limited and intermittent with possible low levels of dust and emissions.

### Noise

Noise impacts associated with the decommissioning phase could be less compared to the construction and operational phases as activities would normally take place during normal daylight hours and movement of vehicles would be minimal. The use of pumps and machinery would also become less.

**Table 36: Nuisance Factors**

<b>THEME: Nuisance Factors</b>		
	<b>Without mitigation</b>	<b>With mitigation / enhancement</b>
<b>Status</b>	Negative (-)	Negative (-)
<b>Severity</b>	3	2
<b>Spatial Scale</b>	3	3
<b>Duration</b>	5	4
<b>Frequency of activity</b>	3	3
<b>Frequency of impact</b>	3	2
<b>Legal Issues</b>	5	5
<b>Detection</b>	3	3
<b>Impact rating</b>	Medium (154) -	Medium (117) -
<b>Mitigation:</b>		
<ul style="list-style-type: none"> <li>A low-risk end-use must be determined in consultation with the relevant authorities, landowners and community representatives</li> <li>Rehabilitation and closure must ensure a low-risk end-use that is both practical and economical</li> <li>The mitigation measures of the Acoustic Impact Assessment should be implemented</li> <li>Dust suppression methods as recommended in the Air Quality Assessment should be strictly implemented as required</li> <li>On-going dust fall out monitoring must be undertaken to monitor emissions</li> <li>Continue with groundwater interception, but decrease the number of boreholes over time, as recommended by the Hydrogeology report.</li> <li>Pollution control measures must be implemented over a long period of time</li> <li>The tailings facility must be stabilised to prevent erosion</li> </ul>		
<b>Cumulative impacts:</b>		
<ul style="list-style-type: none"> <li>None</li> </ul>		
<b>Residual impacts:</b>		
<ul style="list-style-type: none"> <li>Health risks</li> <li>Environmental pollution risks</li> </ul>		

**Expected areas of impact:** The Kareerand TSF expansion site, pipelines, pump stations and surrounds

**Expected cumulative impacts:** None

## 9.7 Community safety issues

### Safety

It is of concern that illegal mining would increase once the operations have ceased. Illegal mining could create health safety risks to the communities and elevate the crime levels in the area. It is therefore critical that safety controls and measures are put in place to avoid illegal miners to access the TSF site, as well as cause damage to or remove any remaining infrastructure. Ongoing security patrols, measures and monitoring would be required beyond the life of the activity.

### Health risks and concerns

Closure and decommissioning of a tailings facility can continue to release harmful substances through seepages and windblown dust. Pollution of soils and water resources (e.g. boreholes, and the Vaal River) would therefore remain a concern as contaminants can affect crop yields and enter the food chain. Inhalation of windblown dust could continue to cause health risks.

These types of harmful deposits must be properly attended to through pollution control systems and rehabilitation measures. It would thus be imperative to ensure public health and safety through compliance to environmental standards and regulations. Possible seepage, impacts on ground water quality, air quality and radioactivity compliance levels must be monitored and sufficiently addressed. Public safety and health concerns must furthermore be addressed through the mitigation measures proposed by the Health Risk Assessment and Radiological Assessment.

The main objective during decommissioning and rehabilitation would be to ensure a safe facility that is stable and non-contaminating, with minimal requirements for on-going maintenance after closure.

**Table 37: Community Safety**

<b>THEME: Community Safety</b>		
	<b>Without mitigation</b>	<b>With mitigation / enhancement</b>
<b>Status</b>	Negative (-)	Negative (-)
<b>Severity</b>	3	2
<b>Spatial Scale</b>	3	3
<b>Duration</b>	5	4
<b>Frequency of activity</b>	3	3
<b>Frequency of impact</b>	4	4
<b>Legal Issues</b>	5	5
<b>Detection</b>	3	3
<b>Impact rating</b>	Medium (165) -	Medium (135) -
<b>Mitigation:</b>		
<ul style="list-style-type: none"> <li>A low-risk end-use must be determined in consultation with the relevant authorities, landowners and community representatives</li> <li>Rehabilitation and closure must ensure a low-risk end-use that is both practical and economical</li> </ul>		

<ul style="list-style-type: none"> <li>• Rehabilitation and closure must ensure that the future risk of failure to the environment and public is reduced</li> <li>• The tailings facility must be rehabilitated to minimise seepage of contaminated water from the tailings storage facility to the surface and ground water sources</li> <li>• The tailings facility must be stabilised to prevent erosion</li> <li>• The final landform should be designed to be compatible to a low-risk the end-use</li> <li>• Continue with groundwater interception, but decrease the number of boreholes over time, as recommended by the Hydrogeology report.</li> <li>• Pollution control measures must be implemented over a long period of time</li> <li>• On-going dust fall out monitoring must be undertaken to monitor emissions</li> </ul>
<p><b>Cumulative impacts:</b></p> <ul style="list-style-type: none"> <li>• Existing industrial activities in the area acting as additional sources of traffic, dust and noise pollution</li> <li>• Existing tailings facilities present in the larger study area</li> <li>• Other mining activities in the area not related to the TFS (e.g. north of the N12)</li> </ul>
<p><b>Residual impacts:</b></p> <ul style="list-style-type: none"> <li>• Health risks</li> <li>• Environmental pollution risks</li> </ul>

**Expected areas of impact:** The Kareerand TSF expansion site and surrounds, boreholes, and Vaal River.

**Expected cumulative impacts:** None

## 10. THE SOCIO-ECONOMIC RISK MANAGEMENT AND MONITORING PLAN

From a social perspective the following objectives and measures, as summarised in Table 39, should be included as part of the Socio-Economic Risk Management Plan (SMP) as part of the Environmental Management Plan (EMP).

**Table 38: Socio-Economic Risk Management and MONITORING PLAN**

SOCIO-ECONOMIC RISK MANAGEMENT AND MONITORING PLAN			
<b>Objective 1:</b>	<b>Maximise local employment opportunities and local procurement during construction and operation and minimise job losses during decommissioning and closure; impact on poverty</b>		
Mitigation: Action/control	Responsibility		Timeframe
Prioritise local (Khuma) labour in the recruitment process as part of the company's own recruitment policy or as part of contractor management plan	MWS contractor	and	Construction and Operations
Prioritise recruiting unskilled workers among the local unemployed	MWS contractor	and	Construction
Provide up-skilling opportunities for unskilled local workers during the construction phase	MWS contractor	and	Construction
Explore possible placement of local construction workers in reclamation operations if additional jobs become available	MWS contractor	and	Construction
The objective should be to reach 100% recruitment of additional/ new unskilled labour from local communities	MWS and Local Authorities		Operations



SOCIO-ECONOMIC RISK MANAGEMENT AND MONITORING PLAN		
Continue to provide skills development opportunities for employees	MWS	Operations
Develop a database of goods and services that could potentially be outsourced to the local community	MWS and Local Authorities	Operations
Develop mechanisms to assist employees, prior to retrenchment date, in the transition phase after closure of the operations. This includes offering portable skilled development programmes during the operational phase of the project, providing assistance in accessing available and suitable jobs with other local mines or companies, providing positions during the Aftercare and rehabilitation phase etc.	MWS and Local Authorities	Decommissioning and Closure
Focus on non-core related local supply links during the operational phase to facilitate easier transitioning of local suppliers to other industries	MWS	Operations, Decommissioning and Closure
<b>Monitoring</b>	Annually as per the agreed commitments and procurement strategies	
<b>Objective 2:</b>	<b>Minimise any potential negative impacts associated with the inflow of workers and jobseekers</b>	
<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
Prioritise local (Khuma) labour in the recruitment process as part of the company's own recruitment policy or as part of contractor management plan	MWS	Construction
The development, publication and widespread dissemination of a recruitment policy could serve to encourage local employment and reduce the potential influx of jobseekers to the area	MWS and Local Authorities	Construction
A communication strategy should be launched to ensure that unrealistic employment expectations are not created	MWS and Local Authorities	Construction
<b>Monitoring</b>	MWS and Local Authority (councillors) annually	
<b>Objective 3:</b>	<b>Enhance economic diversity</b>	
<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
Focus the local procurement programme on non-core mining inputs (e.g. catering, accommodation)	MWS	Construction and Operation
Focus on the support of non-mining related activities in community development programmes and business support programmes	MWS and Local Authority	Construction and Operation
Focus on up-skilling and portable skills for the unskilled workforce of Kareerand. Align a portable skills programme to local, provincial and national skills shortages	MWS and Local Authority	Construction and Operation
<b>Monitoring</b>	MWS on an annual basis	
<b>Objective 4:</b>	<b>Minimise the impact on resource use</b>	
<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
Capture resource saving strategies in a resource use plan to continue minimising the project's energy and water use as far as practicable	MWS and Contractor	Construction and Operation
Prioritise support the development of renewable energy strategies (e.g. waste to energy) in the local municipal areas through the local social development plan	MWS and Contractor	Construction and Operation

SOCIO-ECONOMIC RISK MANAGEMENT AND MONITORING PLAN		
<b>Monitoring</b>	MWS on an annual basis	
<b>Objective 5:</b>	<b>Minimise nuisance factors</b>	
Mitigation: Action/control	Responsibility	Timeframe
The project proponent, MWS, should inform the Local Municipalities, community representatives and affected stakeholders of the proposed construction schedule and development plan	MWS and Contractor	Construction
MWS to continue to communicate openly and frequently with the Local Municipalities, community representatives and affected stakeholders to ensure they are informed about activities that will generate nuisance factors	MWS and Contractor	Construction and Operation
A grievance mechanism must be put in place and all stakeholders should be made aware of the processes to access and implement the grievance mechanism	MWS and Contractor	Construction and Operation
The existing Emergency Management Plan should be amended to include the expansion. It would be important to regularly review the functionality and efficiency of such a plan in conjunction with the local emergency teams, MWS management and affected communities as well as neighbouring landowners	MWS and Contractor	Construction and Operation
The mitigation measures of the Acoustic Impact Assessment should be implemented	MWS and Contractor	Construction and Operation
Dust suppression methods and a dust management plan as recommended in the Air Quality Assessment should be strictly implemented as required	MWS and Contractor	Construction and Operation
Unauthorised access to the TSF site should be prevented. The area must have strict access control and must be fenced off.	MWS	Construction and Operation
Adhere to mitigation measures of the Ground and Surface Water, Air quality, Heath and Radiological Impact Reports	MWS	Operation
A low-risk end-use must be determined in consultation with the relevant authorities, landowners and community representatives	MWS	Decommissioning and Closure
Rehabilitation and closure must ensure a low-risk end-use that is both practical and economical	MWS	Decommissioning and Closure
Continue with groundwater interception, but decrease the number of boreholes over time, as recommended by the Hydrogeology report.	MWS	Decommissioning and Closure
Pollution control measures must be implemented over a long period of time	MWS	Decommissioning and Closure
The tailings facility must be stabilised to prevent erosion	MWS	Decommissioning and Closure
<b>Monitoring</b>	MWS annual environmental performance audits	
<b>Objective 6:</b>	<b>Minimise externalities</b>	
Mitigation: Action/control	Responsibility	Timeframe
Implement mitigation as per the mitigation measures of the respective specialist studies (geohydrology, air quality)	MWS	Construction and Operation
Expand the current community forum into an Environmental Management Working Group to monitor compliance and	MWS and proposed Environmental	Construction and Operation

**SOCIO-ECONOMIC RISK MANAGEMENT AND MONITORING PLAN**

provide advice on the implementation of Environmental Management Plan (EMP). It is recommended that such a working group could consist of an independent representative NGO that has experience and trust in the local area, local community representatives from Khuma, Stilfontein and surrounding farms (not benefiting or seeking gain from the project through employment or procurement), representatives from JB Marks and CLML and representatives from the DMR, DEA and DWS. The group should meet regularly with access to members (compliant to safety regulations) to the relevant sites if needed;	Management Working Group	
Update a disaster management plan in terms of floods, spillages etc. and water quality in collaboration with the Environmental Management Working Group;	MWS and proposed Environmental Management Working Group	Construction and Operation
<b>Monitoring</b>	MWS annual environmental performance audits	
<b>Objective 7:</b>	<b>Mitigate impact on sense of place</b>	
<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
The mitigation measures of the Visual Impact Assessment should be implemented	MWS	Construction and Operation
Concurrent rehabilitation to be undertaken that could include: <ul style="list-style-type: none"> <li>re-vegetation of side slopes;</li> <li>screening where feasible and required;</li> <li>removal of alien vegetation should be undertaken</li> </ul>	MWS	Construction and Operation
The design should limit the surface area footprint as far as possible and should attend to the side slope configuration to lessen impacts	MWS	Construction and Operation
Environmental management of the facility must adhere to environmental regulations and strive towards international best practice	MWS	Construction and Operation
The tailings facility must be stabilised to prevent erosion	MWS	Construction and Operation
The final landform should be designed to be compatible to a low-risk the end-use	MWS	Construction and Operation
A low-risk end-use must be determined in consultation with the relevant authorities, landowners and community representatives	MWS	Decommissioning
Environmental management of the facility must adhere to environmental regulations and strive towards international best practice	MWS	Decommissioning
<b>Monitoring</b>	MWS annual environmental performance audits	
<b>Objective 8:</b>	<b>Minimise risks to community safety</b>	
<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
MWS to continue to communicate openly and frequently with the Local Municipalities, community representatives and affected stakeholders to ensure they are informed about activities that will have an impact on community health, and impacts on the environment. This can be done through the proposed Environmental Management Working Group	MWS	Construction and Operation

## SOCIO-ECONOMIC RISK MANAGEMENT AND MONITORING PLAN

The existing Emergency Management Plan should be amended to include the expansion. It would be important to regularly review the functionality and efficiency of such a plan in conjunction with the local emergency teams, MWS management and affected communities as well as neighbouring landowners	MWS	Construction and Operation
A grievance mechanism must be put in place and all stakeholders should be made aware of the processes to access and implement the grievance mechanism	MWS	Construction and Operation
Dust suppression methods as recommended in the Air Quality Assessment should be strictly implemented as required	MWS	Construction and Operation
The approved dust management plan should be amended to incorporate the TSF expansion	MWS	Construction and Operation
Ongoing dust fall out monitoring must be undertaken to monitor emissions from the project	MWS	Construction and Operation
Unauthorised access to the TSF site should be prevented. The area must have strict access control and must be fenced off	MWS	Construction and Operation
Monitoring of pump stations and pipelines would be required to prevent and pro-actively identify any damage to or interference with these infrastructure	MWS	Construction and Operation
Construct a liner / barrier for the expansion area, even though the existing section of the TSF will remain without a liner / barrier	MWS	Construction
Water quality and quantity monitoring results undertaken by a qualified hydrogeologist should be made available to the proposed Environmental Management Working Group for their review and discussions.	MWS	Operation
Implement surface and groundwater monitoring programmes as proposed by the Geohydrology Assessment	MWS	Operation
Implement pro-active mitigation or improve the interception system accordingly. Pro-actively discuss steps to be undertaken with the proposed Environmental Management Working Group.	MWS	Operation
Continue with the planting of trees below the return water dams to assist in minimising groundwater seepage, as this will also assist in minimising visual impacts in close proximity to the site	MWS	Operation
A low-risk end-use must be determined in consultation with the relevant authorities, landowners and community representatives	MWS	Decommissioning and Closure
Rehabilitation and closure must ensure a low-risk end-use that is both practical and economical	MWS	Decommissioning and Closure
Rehabilitation and closure must ensure that the future risk of failure to the environment and public is reduced	MWS	Decommissioning and Closure
The tailings facility must be rehabilitated to minimise seepage of contaminated water from the tailings storage facility to the surface and ground water sources	MWS	Decommissioning and Closure
The tailings facility must be stabilised to prevent erosion	MWS	Decommissioning and Closure
The final landform should be designed to be compatible to a low-risk the end-use	MWS	Decommissioning and Closure

SOCIO-ECONOMIC RISK MANAGEMENT AND MONITORING PLAN		
Continue with groundwater interception, but decrease the number of boreholes over time, as recommended by the Hydrogeology report	MWS	Decommissioning and Closure
Pollution control measures must be implemented over a long period of time	MWS	Decommissioning and Closure
On-going dust fall out monitoring must be undertaken to monitor emissions	MWS	Decommissioning and Closure
<b>Monitoring</b>	MWS annual environmental performance audits	
<b>Objective 9:</b>	<b>Management of Closure Impacts</b>	
Mitigation: Action/control	Responsibility	Timeframe
Develop mechanisms to assist employees, prior to retrenchment date, in the transition phase after closure of the operations. This includes offering portable skilled development programmes during the operational phase of the project, providing assistance in accessing available and suitable jobs with other local mines or companies, providing positions during the Aftercare and rehabilitation phase etc.	MWS	Decommissioning and Closure
Focus on non-core related local supply links during the operational phase to facilitate easier transitioning of local suppliers to other industries	MWS	Decommissioning and Closure
Develop and implement an exit strategy of any social projects that was implemented during the operational phase well in advance (2 years) before closure of the Project: For example hand-over of projects that does not generate their own income to relevant organisations that can ensure sustainable implementation	MWS	Decommissioning and Closure
Follow a clear communication strategy to inform the local community of arrangements made related to any social spending and project closure. The communication strategy should commence two years prior to project closure	MWS	Decommissioning and Closure
It is recommended that social programmes should focus on projects that can become self-sufficient by generating own income, e.g. agricultural support programmes that train subsistence farmers in more advance agricultural practices	MWS	Decommissioning and Closure
Investments in infrastructure projects should be done in coordination with the relevant authority, e.g. classrooms at local schools should be undertaken along with the Department of Education who can take over maintenance once the project ceases to exist	MWS	Decommissioning and Closure
Commence discussions with local community related to post-closure land-use. Final agreement with the representative community forum on the post-closure management will be needed before signing off on the project closure	MWS, community representatives	Decommissioning and Closure
Formulate and implement an alternative land-use plan	MWS, Community representatives, affected stakeholders and relevant government departments	Decommissioning and Closure
Concurrent rehabilitation to be undertaken	MWS	Decommissioning and Closure

SOCIO-ECONOMIC RISK MANAGEMENT AND MONITORING PLAN		
Re-vegetation of side slopes to be undertaken as soon as feasible	MWS	Decommissioning and Closure
Screening (e.g. planting of trees) to be implemented where feasible and required	MWS	Decommissioning and Closure
Removal of alien vegetation should be undertaken	MWS	Decommissioning and Closure
The tailings facility must be stabilised to prevent erosion	MWS	Decommissioning and Closure
The design should limit the surface area footprint as far as possible and should attend to the side slope configuration to lessen impacts	MWS	Decommissioning and Closure
Environmental management of the facility must adhere to environmental regulations and strive towards international best practice	MWS	Decommissioning and Closure
A low-risk end-use must be determined in consultation with the relevant authorities, landowners and community representatives	MWS, Community representatives, affected stakeholders and relevant government departments	Decommissioning and Closure
Rehabilitation and closure must ensure a low-risk end-use that is both practical and economical	MWS, Community representatives, affected stakeholders and relevant government departments	Decommissioning and Closure
The mitigation measures of the Acoustic Impact Assessment should be implemented	MWS	Decommissioning and Closure
Dust suppression methods as recommended in the Air Quality Assessment should be strictly implemented as required	MWS	Decommissioning and Closure
On-going dust fall out monitoring must be undertaken to monitor emissions	MWS	Decommissioning and Closure
Continue with groundwater interception, but decrease the number of boreholes over time, as recommended by the Hydrogeology report	MWS	Decommissioning and Closure
Pollution control measures must be implemented over a long period of time	MWS	Decommissioning and Closure
<b>Monitoring</b>	MWS annual environmental performance audits	

## 11. SUMMARY AND CONCLUSION

### 11.1 Summary of Socio-Economic Impact Ratings

Table 39 below provides a summary of the ratings for the different impact categories. There are significant positive impacts associated with the proposed project, such as the continuation of employment and income generation, impact on poverty reduction, impact on tax revenue and social investment in communities, as well as stimulation of economic growth. Another positive impact is

the reclamation of scattered tailings facilities throughout the area that could act as possible pollution sources.

There are however several potential negative socio-economic impacts of the proposed project that may affect surrounding landowners and residential areas. These negative impacts associated with the proposed project include the external costs, impact on sense of place, increased nuisance factors (dust levels, noise and traffic movement), and community safety impacts (health risks and concerns, general community safety due to illegal mining activities and increased crime, possible structural failure of the proposed TSF and possible negative impacts on environmental and water resources).

The socio-economic impacts that are rated as medium remains at a medium rating after mitigation or enhancement measures have been applied. There are various socio-economic impacts that are rated as high as the TSF remains a considerable risk due to the environmental impacts associated with such a facility, the size of the structure and the always present risk of failure. These high risks, however, can be mitigated to a medium rating, but is mainly dependent on appropriate and successful environmental management of the tailings facility, as well as the strict implementation of pro-active mitigation and management measures.

**Table 39: Summary of Socio-Economic Impact Ratings**

Socio-economic Impact	Phase	Significance of Impact	
		Pre-mitigation	Post-mitigation
Employment and income generation	Construction	M (80) +	M (99) +
Population influx	Construction	M (110) -	M (99) -
Nuisance factors	Construction	M (144) -	M (120) -
Employment and income generation	Operations	M (121) +	M (132) +
Impact on poverty reduction	Operations	M (99) +	M (110) +
Impact on tax revenue	Operations	H (192) +	H (192) +
Economic diversity	Operations	M (132) -	M (121) -
Increased resource use (water and energy)	Operations	M(165) -	M(150)-
External costs	Operations	H (180) -	M (150) -
Sense of place	Operations	M (165) -	M (150) -
Nuisance factors	Operations	M (140) -	M (126) -
Community safety	Operations	M (165) -	M (150) -
Job and income losses	Decommissioning and Closure	M (169) -	M (132) -
Termination of social funds	Decommissioning and Closure	M (121) -	M (110) -
Loss of agricultural land	Decommissioning and Closure	M (108) -	M (108) -
Sense of place	Decommissioning and Closure	M (121) -	M (100) -
Nuisance factors	Decommissioning and Closure	M (154) -	M (117) -
Community safety	Decommissioning and Closure	M (165) -	M (135) -

## 11.2 Conclusion and Recommendation

The project is anticipated to facilitate the continuation of high economic benefits to the local area, currently faced with high rates of unemployment and poverty. Based on the historical performance of the project in terms of environmental impacts there are however concerns related to the institutional capacity of both AGA and public institutions to monitor and manage project-related environmental externalities that could compromise the long term growth of the local area.

Based on the institutional concerns related to the monitoring and management of project-related impacts the residual environmental costs to the local communities close to the expanded Kareerand TSF could be high. To lower the risks (as well as uncertainties around these risks) and improve the project's 'social license to operate' in the local area the following is recommended:

- The knowledge gaps related to the project should be addressed. These include:
  - The unknown impact on soil and water quality in the case of potential spillages along the along the new or existing pipelines (the specialist studies focuses on the TSF area and not the supporting infrastructure) ;
  - The status and impacts of the rehabilitation of the historical TSFs are unknown;
- It is recommended that the current community forum is expanded into an inclusive Socio-Economic Working Group to monitor compliance and provide advice on the implementation of the Environmental Management Plan (EMP) with specific reference to marginal groups within the community. It is recommended that such a working group could consist of an independent representative NGO that has experience and trust in the local area, local community representatives from Khuma, Stilfontein and surrounding farms (not benefiting or seeking gain from the project through employment or procurement), representatives from JB Marks LM and CLML and representatives from the DMR, DEA and DWS;
- The existing Emergency Management Plan should be reviewed and amended to include the proposed project. It would be important to review the functionality and efficiency of such a plan in conjunction with the local emergency teams, MWS management and affected communities as well as neighbouring landowners.



## 12. SOURCES

### 12.1 Documents

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## 12.2 Websites

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[www.iol.co.za](http://www.iol.co.za)

[www.kaundadistrict.gov.za](http://www.kaundadistrict.gov.za)

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<https://municipalmoney.gov.za>

## 12.3 Interviews

Contact name:	Institution:	Date
Mariette Lieferink	CEO: Federation for a Sustainable Environment	25 March 2020
Johan Kondos	Farmer south west of Kareerand TSF	31 March 2020
Pieter Carraro	Farmer north east of Kareerand TSF	31 March 2020

<b>Contact name:</b>	<b>Institution:</b>	<b>Date</b>
Jaco Kleynhans	Kohra Farm Lodge north west of Kareerand TSF	31 March 2020
Susan Botha	Wesvaal Chamber of Commerce	31 March 2020
Shawn Lethoko	Margaret Community	6 April 2020
Robertson Ponisi	Councillor: Ward 34	7 April 2020
Sylvia Sithole	Councillor: Ward 38	7 April 2020
Pogiso Mabeli	Councillor: Ward 31 ( <i>refused telephonic interview</i> )	8 April 2020
Ben Ntaopane	Councillor: Ward 32	8 April 2020
Johannes Qankase	Councillor: Ward 33	8 April 2020

## 13. ANNEXURE A

### 13.1 DETAILS OF THE SOCIAL IMPACT ASSESSMENT PRACTITIONER

Ms. Ingrid Snyman holds a BA Honours degree in Anthropology. She has 20 years' experience in the social field. Ms. Snyman has been involved in various Social Impact Assessments during her career as social scientist. These project themes consist of infrastructure development, waste management, road development, water and sanitation programmes, township and other residential type developments. She has also been involved in the design and management of numerous public participation programmes and communication strategies, particularly on complex development projects that require various levels and approaches.

### 13.2 CURRICULUM VITAE OF SOCIAL SPECIALIST

#### CURRICULUM VITAE: INGRID SNYMAN

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<b>Name:</b>	<b>Ingrid Helene Snyman</b>	<b>Name of firm:</b>	Batho Earth
<b>Profession:</b>	Social Development Consultant		
<b>Years of Experience:</b>	20 years		

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#### KEY QUALIFICATIONS

- Social Impact Assessment (SIA)
- Public Participation programmes
- Communication, development of community structures and community facilitation
- Community-based training and
- Workshop reports

#### EDUCATION

1992:	B A (Political Science) University of Pretoria
1995:	B A (Hons) Anthropology University of Pretoria
1996 - 1997:	Train the Trainers Centre for Development Administration - UNISA

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#### EXPERIENCE RECORD

**2000 to date**                      **Independent Development Consultant: Batho Earth**

##### Mining Industry

- SEIA for the proposed Khumani Mine, Mokaning Expansion, Kathu, Northern Cape Province (ongoing)
- SEIA and PPP for the proposed Theta Hill Gold Mining Project near Pilgrim's Rest, Mpumalanga (ongoing)
- SIA for the proposed Khulu TSF at Dwarsrivier Mine, near Steelpoort, Limpopo Province (ongoing)
- SIA for the proposed Vandyksdrift Central (VDDC) Mining: Infrastructure Development, Mpumalanga (ongoing)
- PPP for the development of various additional listed activities at the Dwarsrivier Chrome Mine, near Steelpoort, Limpopo Province
- SIA and Public Participation for the proposed Project 10161 and Project 10167 (Gold Mining) by Stonewall (Pty) Ltd., near Sabie and Pilgrims Rest, Mpumalanga
- SIA for the proposed Tharisa Mine UG1 Project, near Marikana, North West Province

- SIA for the Manganese Mine North West of Hotazel, Northern Cape (Mukulu Environmental Authorisation Project)
- SIA for the proposed South32 SA Coal Holdings Middelburg Colliery Environmental Management Plan (EMP) and Water Use Licence (WUL) Application Project (Life of Asset Open Cast Expansion and Dispatch Rider Project), Middelburg, Mpumalanga
- SIA for the proposed Manganese Mine on the Remaining Extent of the Farm Paling 434, Northern Cape Province: Revision And Amendment Of Existing Approved Environmental Management Programme (EMP) For A Mining Right
- SIA and Public Participation for the proposed Western Bushveld Joint Venture Project (Maseve Platinum Mine), North West Province
- Public Participation for Sable Platinum for the proposed prospecting application on the farm Doornpoort, Pretoria, Gauteng
- Public Participation for the prospecting application on the farms Frischgewaagd and Kleinfontein, Mpumalanga Province for PTM
- SIA to determine the impact of the Tharisa Mine on the neighbouring properties and property owners, Buffelspoort area, near Marikana, North West Province
- Public Participation for the prospecting application on the farm Klipfontein, Gauteng for PTM
- SIA as part of the Basic Assessment for the extension of the Komati coal stockyard, Mpumalanga
- SIA for the proposed Dorstfontein Mine Western Expansion Project, Kriel, Mpumalanga
- SIA for the proposed Grootboom Platinum Mine, Steelpoort, Limpopo Province
- SIA for the proposed Dorstfontein Mine Expansion Project, Kriel, Mpumalanga

#### **Bulk Infrastructure and Supply**

- SEIA for the proposed K43 Road Construction near Lenasia, Gauteng (ongoing)
- SIA for the proposed Mangaung Bus Depot for the Integrated Public Transport Network (IPTN) in Bloemfontein, Free State
- SEIA for the proposed Greenwich Landfill Site, Newcastle, KwaZulu Natal
- SIA for the proposed Mangaung Gariiep Water Augmentation Project, Free State
- SIA for the proposed development of the new Tshwane Regional General Waste Disposal Facility (Multisand Landfill), Pretoria, Gauteng Province
- SIA as part of the Basic Assessment for the proposed K97 Road northbound of the N4 at Bon Accord and investigation with regards to the possible resettlement of business premises, Pretoria, Gauteng
- SIA for the proposed extension of the Wemmershoek Wastewater Treatment Works (WWTW), decommissioning of the Franschoek WWTW and construction of a transfer and outfall sewer between the two works, Franschoek, Western Cape
- SIA for the proposed Lefaragathle, Mogono, Rasimone, Chaneng outfall sewer and Chaneng sewer treatment plant, Rustenburg (Phokeng), North West Province
- SIA for the proposed upgrading of railway stations and railway line for Metrorail in Mamelodi, Gauteng
- SIA for the proposed ACSA Remote Aprons Project, O.R. Tambo International Airport, Gauteng
- Public Participation and SIA as part of the Environmental Scoping Study for the proposed upgrading of the Waterval Water Care Works

#### **Ecosystem Services Review**

- Proposed Ngonye Falls Hydro-Electric Power Plant Project, Western Province, Zambia: Biodiversity Assessment: Stakeholder Engagement Plan and Social Assessment for the Ecosystem Services Review (ESR)

#### **Projects related to electricity generation, transmission and distribution**

- SIA for the proposed Crowthorne-Lulamisa power line, Midrand, Gauteng
- SIA as part of the Basic Assessment for the proposed Crowthorne Underground Cable, Gauteng

- SIA as part of the Basic Assessment for the proposed Diepsloot East Servitude and substation, Gauteng
- SIA for the proposed Mitchells Plain-Firgrove-Stikland Transmission Line project and investigation with regards to the possible resettlement of individuals within Mitchells Plain, Western Cape
- SIA for the proposed 400 kV Transmission Power Line for approximately 10km to the west of the existing Marathon Substation and possible resettlement of homesteads, Nelspruit area, Mpumalanga
- SIA as part of the Basic Assessment for the proposed construction of a 400 kV transmission line between the Ferrum substation (Kathu) and the Garona substation (Groblershoop), Northern Cape Province
- SIA as part of the Basic Assessment for the proposed construction of the Eskom Rhombus-Lethabong 88kv Powerline and Substation, North West Province
- SIA for the proposed Aberdeen-Droerivier 400 kV Transmission Power Line, Eastern and Western Cape Province
- SIA for the proposed Houhoek Substation Upgrade and Bacchus-Palmiet Loop-In and Loop-Out, near Botrivier, Western Cape Province
- SIA for the proposed Arnot-Gumeni 400 kV Transmission Power Line, Mpumalanga
- SIA for the proposed Aggeneis-Oranjemond Transmission Line project, Northern Cape Province
- SIA for the proposed Ariadne-Venus Transmission Line, KwaZulu Natal
- SIA for the proposed Dominion Reefs Power Line project, North West Province
- SIA for the proposed Kyalami Strengthening Project, Kyalami, Gauteng
- SIA for the proposed Apollo Lepini 400 kV Transmission Line Project, Tembisa, Gauteng
- Public Participation for the proposed new Medupi (then referred to as Matimba B) coal-fired power station in the Lephalale area, Limpopo Province
- Public Participation and SIA for the proposed Poseidon-Grassridge No. 3 400 kV Transmission line and the extension of the Grassridge Substation, Eastern Cape Province
- Public Participation and SIA for the proposed construction of power lines between the Grassridge Substation (near Port Elizabeth) and the Coega Industrial Development Zone, Eastern Cape Province
- Public Participation and SIA for the Matimba-Witkop No. 2 400 kV Transmission line in the Limpopo Province

### **Photovoltaic and Wind Energy Facilities**

- SIA for the proposed Christiana PV facility on the farm Hartebeestpan, North West Province
- SIA for the proposed Hertzogville PV facility on the farms Albert and Wigt, Free State Province
- SIA for the proposed Morgenzon PV facility on the farm Morgenzon, Northern Cape Province
- SIA as part of the Basic Assessment Process for the Exxaro Photovoltaic Facility, Lephalale, Limpopo Province
- SIA for the Upington Solar Energy Facility, Northern Cape Province
- SIA for the Kleinbegin Solar Energy Facility, Northern Cape Province
- SIA for the proposed Ilanga solar thermal power plant facility on a site near Upington, Northern Cape Province
- SIA and public participation for the proposed Karoo Renewable Energy Facility, Northern Cape
- SIA for the Wag'nbiekiespan Solar Energy Facility, Northern Cape Province
- SIA for the proposed Kathu and Sishen Solar Energy Facilities, Northern Cape Province
- Public Participation and SIA for the proposed Thupela Waterberg Photovoltaic Plant, Limpopo Province
- SIA for the proposed Kannikwa Vlake Wind Farm Project, Northern Cape

### **Township Developments**

- SEIA for the Gauteng Rapid Land Release Programme: Four Sites: Hekpoort / Bryanston / Lenasia / Rietfontein (Ennerdale), Gauteng
- SIA for the proposed Wildealskloof Mixed Use Development near Bloemfontein, Free State

- SIA for the proposed Mixed Land Use Township Establishment on the Remainder of Portion 406 of the Farm Pretoria Town and Townlands 351 JR, and investigation with regards to the possible resettlement of households, Salvokop, Tshwane CBD
- SIA for the proposed Mixed Land Use Development situated on the Remainder of Allandale 10 IR, known as Rabie Ridge Ext 7, Midrand, Gauteng
- SIA as part of the Basic Assessment for the proposed development of Project One (1) of the Vosloorus Extension 9 High Density Housing Project, Ekurhuleni Metropolitan Municipality
- SIA for the proposed Mapochsgronde Residential Development, Roossenekal, Limpop Province
- SIA for the proposed Cullinan Estate Development, Cullinan, Gauteng
- SIA for the proposed Vlakfontein Residential Development and investigation with regards to the possible resettlement of individual households, Brakpan, Gauteng
- SIA for the proposed township development/eco-estate on the farm Grants Valley, Eastern Cape

#### **Public Participation**

- Public Participation for Dwarsrivier Chrome Mine (Pty) Ltd.: Environmental Authorisation Application for various Listed Activities at the Dwarsrivier Chrome Mine, Near Steelpoort, Limpopo Province (ongoing)
- Public Participation for the proposed piggery near Modimolle, Limpopo Province
- Public Participation for the proposed development of a Truck Stop, Buffelspoort, North West Province
- Public Participation for the upgrading of the Menlyn Road Network and the investigation, as well as negotiations with regards to the resettlement of households, Pretoria, Gauteng
- Public participation and SIA for the proposed Platinum Highway Project from the N1 (Gauteng) to the Botswana Border (North West Province), including investigations with regards to the possible resettlement of individual households
- Public participation assistance for the proposed construction of a brewery and associated industrial activities for Heineken Supply Co (Pty) Ltd, Kempton Park, Gauteng.

### 13.3 DETAILS OF THE ECONOMIC IMPACT ASSESSMENT PRACTITIONER

An Kritzinger (Masters Economics) has been working as consultant in the economic development field for the past seventeen years. Her work has concentrated on applied economic modelling in South Africa, Namibia, Botswana and Mozambique including macro-economic impact analysis, economic cost benefit analysis, economic impact assessments, social incidence studies and macroeconomic forecast modelling. She also has extensive experience in the socio-economic profiling and economic development plans for local authorities and districts in South Africa and has designed and implemented a training project for capacity training in sustainable local economic development monitoring for district municipalities throughout South Africa in collaboration with the Development Bank of Southern Africa.

### 13.4 CURRICULUM VITAE OF ECONOMIC SPECIALIST

#### CURRICULUM VITAE: AN KRITZINGER

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<b>Name:</b>	<b>Anna Sophia Kritzinger</b>	<b>Name of firm:</b>	Southern Economic Development
<b>Profession:</b>	Economic Development Specialist		
<b>Years of Experience:</b>	18 years		

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#### KEY QUALIFICATIONS

- Economic impact assessments
- Applied economics (macro-economic and social impact analysis; economic cost benefit analysis, economic incidence analysis, scenario planning)
- Skills development in development profiling and strategies
- Economic databases & economic reviews
- Local social and economic development strategies
- Industry and market analysis
- Analyses of higher education systems in Africa (analyses of demand and supply factors)

#### EDUCATION

1985:	B.Admin (Hons) (Economics) (University of Pretoria)
1992:	M.Admin (Economics) (University of Stellenbosch)

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#### EXPERIENCE RECORD (1998- current)

##### Economic impact analyses:

- Socio- economic impact assessment for the closure of Ezulwini gold mine, Gauteng (2016)
- Socio- economic impact assessment for Herculite Ferrochrome Complex, North West (2016)
- Socio- economic impact assessment of the Cape Health Technology Park, Western Cape (2016)
- Socio-economic impact assessment for route selection of power lines in Mpumalanga (Jones and Wagener, 2016)
- Study lead for revenue management study, entailing the identification of mitigation strategies related to project –related revenues (employment and public revenues) for a large-scale gas project for Anadarko petroleum in Mozambique (2012-2014)
- Socio-economic impact assessment for Jeanette mine, Free State (2015)



- Economic study for a waste disposal site in Tshwane, Gauteng (2014)
- Economic impact assessment as part of Social Impact Assessment (SIA) of a Glencore/Xtrata chrome mine in Rustenburg, Mpumalanga (2014)
- Economic impact assessment as part of Social Impact Assessment (SIA) for the extension of a mining right application for Boschmanspoort coal mine in Mpumalanga (2014)
- Economic impact assessment as part of Social Impact Assessment (SIA) for a casino/retail project in Delmas, Mpumalanga (2014)
- Economic study for a private regional landfill in the Ga-Rankuwa area of City of Tshwane (2014)
- Economic impact assessment as part of SIA for a CFB coal plant in Delmas area, Mpumalanga, South Africa (2013)
- Economic impact assessment as part of SIA of a coal mine in Chrissiesmeer, Mpumalanga, South Africa (2013)
- Economic impact assessment as part of SIA for an existing vanadium mine in the Brits area (2012)
- Economic impact assessment as part of SIA for selected wind farms and solar plants in the Northern Cape, Sivest (2012)
- Economic impact assessment as part of SIA for a diamond mine in Alexander Bay area, West Coast, South Africa (2012)
- Measured the impact of the global financial crisis on the mining industry of 8 SADC countries including South Africa (SADC countries; 2009);
- Conducted an analysis of the economic contribution of state owned enterprises to the Namibian economy (Namibia; 1999 and 2009).
- Conducted a socio economic impact analysis for the development of an Africa centre and sustainable housing development project in the Western Cape (South Africa; 2007); (Namibia, South Africa, Botswana; 2005- );
- Developed economic criteria for the evaluation of projects for the Strategic Infrastructure Programme (SIP) for the Western Cape Province( 2005)
- Conducted the economic evaluation of an infrastructure project in the Mosselbay area (South Africa;2001);
- Economic impact assessment for horse-mackerel industry (Namibia 2003)

**Local Economic Development- related work:**

- Conducted the economic impact analyses for a SMME development finance institution (CEDA) in Botswana, (Deloitte Botswana, 2016)
- Managed and conducted a research project pertaining to Business Retention and Attraction Strategies to inform strategic inputs to improve programmes on behalf of Deloitte Namibia for the Local Economic Development Association (LEDA) of Namibia (Namibia, 2013)
- Designed and implemented a training project for capacity training in sustainable local economic development (including the “green economy”) monitoring for district municipalities throughout South Africa. The project was developed in collaboration with Inwent and the Development Bank of Southern Africa (South Africa; 2008 – 2011). The project has been developed further as one of the courses that forms part of the University of Johannesburg’s Centre of Local Economic Development degree programme;
- Evaluated local economic development projects in the Western and Eastern Cape. These studies involved the evaluation of existing economic development projects and the identification of LED projects that the NGO-client could potentially get involved in (South Africa, 2002);
- Managed a team in conducting a business survey and Local Economic Development action plan for the eastern parts of Cape Town, including township areas such as Mfuleni and parts of Macassar. The project included extensive consultation sessions with community organisations (South Africa; 2007);
- Compiled various socio economic development profiles for various South African local authorities including profiles for George municipality; Drakenstein municipality, the Overberg region and Oudtshoorn

municipality that were used to inform the Local Development for the towns and district. The profiles and identification of relevant projects involved community facilitation work (South Africa;1998-2008);

- Developed a socio economic database for the Cape Metropolitan Area. The study was updated to an extensive economic analysis of the city and some indicators were extended to include all the different regions of the Western Cape (South Africa;1998, 2001);

#### **Industry profiles and market analysis:**

- Conducted research and compiled the synthesis report for geothermal potential in the African rift valley (2011)
- Conducted various research reports on global sectors e.g. the global oil and gas industry and ship building and repairs (Global, Africa, South Africa; 2003-2007)
- Managed the compilation of an “invest in Cape Town report” for Wesgro (2011)
- Managed a sector survey and profile for the Cape Town Boat building industry (South Africa, 2008);
- Compiled an industry profile for the City of Johannesburg. The study involved a survey of numerous companies and informed the city about the relative importance of the sector for the City of Johannesburg on the hand of various development criteria (South Africa; 2003).

#### **Higher education analyses in Africa:**

- Conducted a demand and supply review of the higher education system of Namibia including a gap analyses of current and forecasted labour demand and supply of higher education qualifications (Namibia; 2012 and 2014)
- Managed a situational analysis and done a market analysis as well as economic cost benefit analysis for Botswana Export Development Agency with Deloitte SA to investigate the feasibility of a tertiary education hub to diversify the Botswana economy (Botswana; 2009).

#### **Economic cost benefit analysis:**

- Conducted a high level economic cost benefit analyses for a regional landfill project in Ga-Rankuwa, City of Tshwane as extension for an economic impact assessment (South Africa, 2014)
- Conducted an economic cost benefit analyses for a coal mine near Chrissiesmeer, Mpumalanga as part of alternative land-use study for a mining application study (South Africa, 2013)
- Conducted an economic cost benefit analysis for an agricultural irrigation project in the Pandamatenga area (Botswana, 2010);
- Conducted an economic cost benefit analysis for Botswana Export Development Agency with Deloitte SA to investigate the feasibility of a tertiary education hub to diversify the Botswana economy (Botswana; 2009)

#### **Other macro-economic modeling:**

- Developed an economic forecast model for the City of Cape Town and the Western Cape economy (City of Cape Town; 2005 updated in 2011, extended to Western Cape in 2014);
- Conducted research to establish the economic contribution of agricultural research in South Africa to assist the motivation of increased public grants to the main agricultural research body (South Africa; 2011)
- Conducted a comparative economic incidence analysis between fuel levies and motor vehicle licence fees for the Western Cape (South Africa; 2007 updated in 2011)

#### **References:**

- Herman Marais (Strategy Partners Agricultural Venture Capital Fund) +27 83 377 6234; hermanm@agrivie.com;
- Nigel Gwynne-Evans, Chief Director: African Industrial Development, Department of Trade and Industry, Tel: 012 394 3951; Cell: 083 641 5173, ngwynne-evans@thedti.gov.za

- Johan Hayes, (AECOM: Africa Practice Lead: Impact Assessments; +27 +27 (0) 82 859 1932  
johan.hayes@aecom.com
- Professor Rolf Stumpf (higher education specialist) +27 (0) 82 612 5316

### 13.5 DECLARATION OF INDEPENDENCE

In terms of the National Environmental Management Act (Act No. 107 of 1998) (NEMA), as amended in respect of the EIA Regulations of December 2014, and GNR 982 published on 4 December 2014, an independent consultant must be appointed to act on behalf of the client. In this regard Batho Earth and SED submit that they have:

- The necessary required expertise to conduct a Social Impact Assessment, including the required knowledge and understanding of any guidelines or policies that are relevant to the proposed process;
- Undertaken all the work and associated studies in an objective and independent manner, even if the findings of these studies are not favourable to the project proponent;
- No vested financial interest in the proposed project or the outcome thereof, apart from remuneration for the work undertaken under the auspices of the above-mentioned regulations;
- No vested interest, including any conflicts of interest, in either the proposed project or the studies conducted in respect of the proposed project, other than complying with the required regulations; and
- Disclosed any material factors that may have the potential to influence the competent authority's decision and/or objectivity in terms of any reports, plans or documents related to the proposed project as required by the regulations.

Anna Sophia Kritzinger



Ingrid Helene Snyman



Signature of the specialist (electronically signed):

Southern Economic Development / Batho Earth

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Name of company (if applicable):

Date: 2 April 2020