ENVIRONMENTAL AUTHORISATION APPLICATION FOR NEW CAPITAL PROJECTS AND THE PROPOSED NEW KHULU TAILINGS STORAGE FACILITY AND ASSOCIATED INFRASTRUCTURE

DWARSRIVIER CHROME MINE, STEELPOORT AREA, MPUMALANGA

SOCIO-ECONOMIC IMPACT ASSESSMENT

DRAFT REPORT

Submitted to:

Envirogisticts (Pty) Ltd.

Submitted by:

Batho Earth

PO Box 35130, Menlo Park, 0102

Cell: +27 082 779 2750

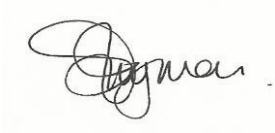
E-Mail: ingrid@bathoearth.co.za

Batho Earth

Social and Environmental Consultants

October 2021

DOCUMENT STATUS

SOCIO-ECONOMIC IMPACT ASSESSMENT: Draft	
Date:	October 2021
Authors:	Ms. Ingrid Snyman: Batho Earth
Signature:	

GLOSSARY OF ABBREVIATIONS

DCM:	Dwarsrivier Chrome Mine (Pty) Ltd.
DMRE:	Department of Mineral Resources
EAP:	Environmental Assessment Practitioner
EIA:	Environmental Impact Assessment
EMPr:	Environmental Management Programme
EMPR:	Environmental Management Programme Report
FTLM:	Fetakgomo Tubatse Local Municipality
IDP:	Integrated Development Plan
MPRDA:	Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002)
NEMA:	National Environmental Management Act, 1998 (NEMA) (Act 107 of 1998)
NWA:	National Water Act, 1998 (NWA) (Act 36 of 1998).
RE:	Remaining Extent
RWD:	Return Water Dam
SDF:	Strategic Development Framework
SEIA:	Socio-Economic Impact Assessment
SLP:	Social and Labour Plan
StatsSA:	Statistics South Africa
TSF:	Tailings Storage Facility
TRP:	Two Rivers Platinum Mine

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1. INTRODUCTION AND BACKGROUND TO THE PROPOSED PROJECTS

Dwarsrivier Chrome Mine (Pty) Ltd. (DCM) is located 25 km south of Steelpoort in the Limpopo Province. The mine currently holds the mining rights and surface rights for Portion 1 (Remaining Extent (RE)) and Portion 0 (RE) of the farm Dwarsrivier 372KT. The surface rights also extent onto Portion 4 (a portion of Portion 3) of the farm de Grootteboom 373KT. In addition to the above, DCM also owns mining rights on Portions 6 and 7 of the farm Dwarsrivier 372KT, of which the surface rights are owned by Two Rivers Platinum Mine (TRP).

Dwarsrivier has been mining chromite ore from the LG6 seam since 1999. Between 1999 and 2005, ore was mined using opencast methods. The six (6) pits have subsequently been mined out and backfilled, with the exception of the South and North Pit portals from which access is gained to the underground workings. The current mine plan extends the life of the operations to the year 2042.

DCM is proposing new capital projects and the new Khulu Tailings Storage Facility (TSF) and associated infrastructure. The projects can be summarised as follows:

- Project 1: Khulu TSF, where four alternative sites will be investigated. A Return Water Dam (RWD) is also proposed.
- Project 2: Diesel and Emulsion Batching.
- Project 3: Extension of Main Parking Area.
- Project 4: Widening of Access Road between South Shaft/Main Offices and Plant.
- Project 5: Access Crossing between Plant and North Mine.

Envirogistics (Pty) Ltd. was appointed by DCM as Environmental Assessment Practitioner (EAP) to undertake the necessary Environmental Authorisations for the proposed projects. A Socio-Economic Impact Assessment (SEIA) will be conducted as part of the Environmental Authorisation Process.

1.1 Project 1: Khulu TSF and associated infrastructure

DCM is currently depositing at the existing North Tailings Storage Facility (NTSF) at the eastern side of the process plant on the remaining portion of the Farm Dwarsrivier 372KT. It is anticipated that the existing active NTSF will soon reach its full capacity and therefore seven (7) potential TSF sites were identified in 2019. During the initial assessment the number of sites were reduced to four (4) sites, namely Sites B, C, D and F.

A future Eskom substation, however, was planned on Site B, which was the preferred site. Site B was then disregarded and during the 2019 Site Selection Process, Site D was selected as the preferred site for the mine.

Subsequent to the 2019 Site Selection Process, further geotechnical studies were undertaken, which identified potential concerns for Site D, which also included the proximity of the non-perennial tributary of the Dwarsrivier River. In addition to this, the Eskom substation is no longer planned, which has reintroduced Option B into the overall assessment.

Three sites will now again be assessed. These are:

- TSF Option B (20ha and 37 m in height) located on the farm Dwarsrivier 372KT RE;
- TSF Option C (28ha and 29 m in height) located on the farm Dwarsrivier 372KT Remainder of Portion 1; and
- TSF Option D (21ha and 49 m in height) located on the farm Dwarsrivier 372KT RE.

TSF Option B is the preferred site for DCM. The ancillary infrastructure is also proposed on the farm Dwarsrivier 372KT RE. The Return Water Dam (RWD) for Option B (±2ha) is proposed on the farm Dwarsrivier 372KT Remainder of Portion 6, but the location can still change to Dwarsrivier 372KT RE. The location of the facility will be finalised once the preferred site has been decided.

The project will involve the piping of tailings to a filter press facility from where the filter cake will be trucked to the new TSF. A life of mine of about 20 years are currently considered as part of the design.

Herewith the location of the initial four sites. Three sites (Site B, C and D) will now be assessed:

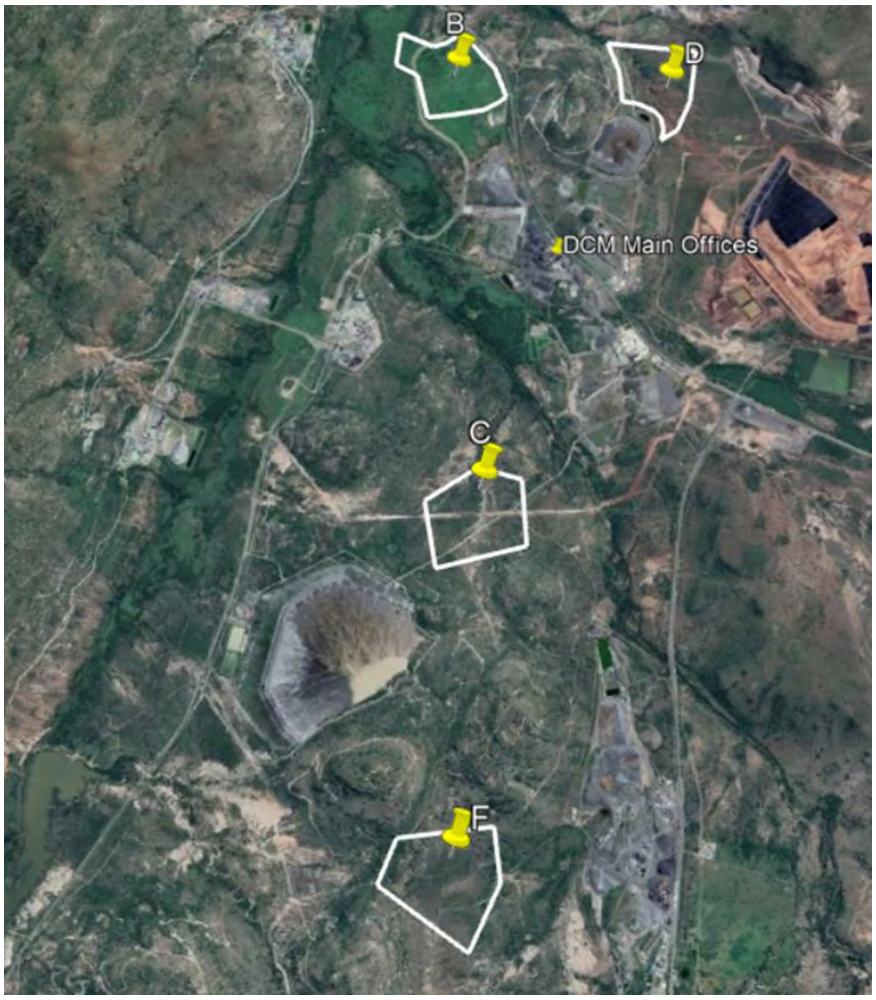

Figure 1: Proposed TSF site alternatives

1.2 Project 2: Diesel and Emulsion Batching

DCM plans to erect two (2) diesel and emulsion batching areas, to supply diesel and emulsion to the underground mining operations. The location of this area is to the north-east of the old Two Rivers Platinum Mine (TRP), just north of the new TRP TSP Pipeline. The project (1.6ha) is proposed on the farm Dwarsrivier 372KT Remainder of Portion 1 and will include:

- Construction of an approximate 80m access road to the diesel batching area;
- Parking area, with security office at both areas (no dangerous good storage planned at any time);
- The following tanks will be located at the Diesel Batching area: 23m^3 Diesel; 23m^3 Engine Oil and 23m^3 Hydraulic Oil.
- A 60m^3 emulsion tank will be placed at the Emulsion Batching areas.
- The tanks will feed into a pipeline for underground use at both areas.

Clearance of indigenous vegetation of approximately 1.3ha will be required.

The following figure indicates the location of the diesel and emulsion batching areas:

Figure 2: Diesel and emulsion batching areas

1.3 Project 3: Main Parking Extension

The Mine requires the expansion of the existing parking area at the Main Offices. The current parking area is about 0.8ha with the parking bays not sufficient to cater for the number of vehicles. The current parking bay comprises of a tarred surface area and steel roof parking bays. The same principle will be applied at the expanded area. No new entrances will be required. The planned parking bay expansion will be located about 20m from the Springkaanspruit on the farm Dwarsrivier 372KT Remainder of Portion 1 and will be approximately 0.5ha.

Clearance of indigenous vegetation will be required in the order of approximately 4 900m^2.

The location of the planned extension is indicated in the figure below.

Figure 3: Proposed Parking area extension

1.4 Project 4: Widening of Access Road between South Shaft/Main Offices and Plant

An existing road provides access between the Main Office Buildings and the Plant. The current width of the road ranges between 5-6m. To accommodate larger vehicles such as Trucks, DCM is planning on increasing a section of 700m of this road to a width of 16m (to accommodate two-way traffic). This will mainly be located on the farm Dwarsrivier 372KT Remainder of Portion 1 (0.3ha).

Clearance of indigenous vegetation will be required in the order of approximately 3 311m^2.

The figure below indicates the location where widening of the road would be required.

Figure 4: Widening of access road

1.5 Project 5: Access Crossing between Plant and North Mine

To ensure more optimal logistical management of traffic between the South Mine and the North Mine, and to reduce the number of vehicles on the regional road, the mine is planning the construction of a new road under regional road bridge to allow for access between the two areas. Project 5 will be located on the farm Dwarsrivier 372KT RE and will be approximately 0.2ha.

Clearance of indigenous vegetation will be required in the order of approximately 1 700m^2.

Figure 5: Location of new road under road crossing

2. PURPOSE OF THE REPORT

The purpose of the SEIA report is to provide the findings of the SEIA undertaken during the EIA Phase. The investigation from a socio-economic perspective focuses on Sites B, C, and D for the proposed Khulu TSF. The following will be undertaken:

- Determining the current socio-economic status of the area and the social characteristics of the receiving environment;
- Indicating the anticipated core impact categories and impact areas (possible hot spots) for each of the different projects;
- Identifying anticipated positive socio-economic impacts of the different proposed projects, including positive impacts and provide management measures for these impacts;
- Identifying and highlighting negative social impacts (social hot spots) of the different proposed projects and indicate mitigation measures to deal with these impacts; and
- Assess the suitability of the different sites for the proposed Khulu TSF based on the socio-economic environment and possible impacts in this regard;

- Presenting the findings, recommendations and conclusions of the social study.

3. DEFINITION OF A SOCIO-ECONOMIC IMPACT ASSESSMENT

Burdge (1995) describes a Social Impact Assessment as the "…systematic analysis in advance of the likely impacts a development event (or project) will have on the day-to-day life (environmental) of persons and communities." A SEIA therefore attempts to predict the probable impact of a development (before the development actually takes place) on people's way of life (how they live, work, play and interact with one another on a daily basis), their culture (their shared beliefs, customs and values) and their community (its cohesion, stability, character, services and facilities), by:

- Appraising the social impacts resulting from the proposed project;
- Relating the assessed social impacts of the project to future changes in the socio-economic environments that are not associated with it. This would serve to place the impacts of the project into context;
- Using the measurements (rating) to determine whether the impacts would be negative, neutral or positive;
- Determining the significance of the impacts; and
- Proposing mitigation measurements.

A SEIA is thus concerned with the human dimensions of the environment, as it aims to balance social, economic and environmental objectives and seeks to predict, anticipate and understand the potential impacts of development.

The usefulness of a SEIA as a planning tool is immediately clear, in that it can assist the project proponent to conceptualise and implement a project in a manner which would see the identified negative socio-economic impacts addressed through avoidance or mitigation and the positive impacts realised and optimised. It would also allow the community to anticipate, plan for and deal with the social changes once they come into effect. In this sense then, the SEIA is an indispensable part of the EIA, the Environmental Management Plan (EMP) and any participative activity (e.g. community involvement in mitigation and monitoring during planning and implementation).

4. LEGAL REQUIREMENTS AND GUIDELINES

4.1. General

In South Africa, the National Environmental Management Act, 1998 (NEMA), provides the legal framework for the correct use and management of the environment. Many developments undertaken by both public and private sector organisations require, by legislation, an Environmental Impact Assessment (EIA). 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.

An EIA is depended 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 has been superseded with the 2014 EIA Regulations, GNR 982 published on 4 December 2014 and came into operation on 8 December 2014.

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

Other applicable legislation (Acts and Guidelines) include:

- Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA);
- National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) and associated Environmental Impact Assessment Regulations, 2014, as amended in 2017 (EIA Regulations);
- The Social and Labour Plan required by MPRDA and MPRDA Regulations GN R527 (Part II Regulations 40 to 46); and
- Guidelines and Principles for Social Impact Assessment published by the International Association of Impact Assessment (2003).

4.2. EIA Regulations Checklist

Herewith the checklist and requirements for Specialist Reports, as Contained in the 2014 EIA Regulations, as amended:

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

EIA REGULATIONS 2014 GNR 982 Appendix 6 CONTENT OF THE SPECIALIST REPORTS	**Status / 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;	Section 18 **Error! Reference source not found.**
b) a declaration that the specialist is independent in a form as may be specified by the competent authority;	Section 19
c) an indication of the scope of, and the purpose for which, the report was prepared	Section 2
cA) an indication of the quality and age of base data used for the specialist report	Statistics from Census 2011 were used. Where available statistics from Household Survey of 2016 (StatsSA) were used.
cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change	Section 8**Error! Reference source not found.**
d) the duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment;	Section 6

EIA REGULATIONS 2014 GNR 982 Appendix 6 CONTENT OF THE SPECIALIST REPORTS	Status / Cross-reference in this Report
e) a description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used;	Section 6
f) details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternatives;	Sections 8 and 9
g) an identification of any areas to be avoided, including buffers;	Section 10
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	Section 1
i) a description of any assumptions made and any uncertainties or gaps in knowledge;	Section 5
j) a description of the findings and potential implications of such findings on the impact of the proposed activity or activities;	Sections 8 9, 10, 11 and 12
k) any mitigation measures for inclusion in the EMPr	Section 14
l) any conditions for inclusion in the environmental authorisation;	Section 14
m) any monitoring requirements for inclusion in the EMPr or environmental authorisation;	Section 14
n) a reasoned opinion • whether the proposed activity, activities or portions thereof should be authorised; • regarding the acceptability of the proposed activity or activities; and • if the opinion is that the proposed activity, activities 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;	Section 16
o) a description of any consultation process that was undertaken during the course of preparing the specialist report;	Section 6
p) a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	N/A
q) any other information requested by the competent authority	N/A
2) Where a government notice gazetted by the Minister provides for any protocol or minimum information requirement to be applied to a specialist report, the requirements as indicated in such notice will apply.	N/A

5. GAPS, LIMITATIONS AND ASSUMPTIONS

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

- A SEIA aims to identify possible socio-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.
- Additional information may become known or available during a later stage, which could not have been allowed for at the time of the study.
- Technical and other information provided by the client is assumed to be correct.

6. METHODOLOGY

The broad steps followed as part of the assessment are discussed below.

6.1 Scope of the Assessment

Based on information received from Dwarsrivier Chrome Mine and Envirogistics (Pty) Ltd., the scope of the assessment was determined. This involves an investigation to identify the framework of the project through the identification and demarcation of the study area. Once the study area was determined, an evaluation framework was developed which assisted in identifying the main anticipated impacts. Scoping further involved an outline of the social characteristics of the area which included the following:

- Background of the study area;
- Existing social characteristics of the affected communities;
- Culture, attitudes and socio-psychological conditions;
- Population characteristics and demographics;
- Community and institutional structures;
- Community resources; and
- A broad economic profile of the area.

6.2 Site Visit

The social consultant undertook a site visit to the different sites on 4 December 2018 to undertake a preliminary inspection of the potential candidate sites to obtain site specific data prior to the ranking of these sites, and to familiarise themselves with the location of the different sites.

No site visit was required for the 2021 assessment. Literature Review, Analysis and Desktop Studies

The literature review and desktop studies assisted the consultant in confirming the social setting and characteristics of the study area, as well as the key economic activities. The initial phase of the investigation thus consisted of relevant data collection and an evaluation aimed at the identification of the broader socio-economic environment.

Secondary data, which was not originally generated for the specific purpose of the study, were gathered and analysed for the purposes of the study. Such data included the census data, project maps, and planning documentation such as the draft Integrated Development Plans (IDP) of the Fetakgomo Tubatse Local Municipality (FTLM).

6.3 Criteria Used

6.4 Literature Review, Analysis and Desktop Studies

The literature review assisted the consultants to establish the social setting and characteristics of the study area, as well as the key economic activities. Secondary data, which was not originally generated for the specific purpose of the study, were gathered and analysed for the purposes of the study. Such data included maps, census data, internet searches, and the Integrated Development Plan (IDP) of the Tsantsabane Local Municipality.

6.5 Consultation

The consultant is involved in the public participation process. Information was gathered and social issues were identified and verified through the public participation process. As part of the public participation process, specific information related to the social environment and insight into community and stakeholder perceptions with regards to the proposed development were obtained.

6.6 Profiling

Profiling serves to build on information generated during the scoping process. It involves a description of the social characteristics and history of the area being assessed, an analysis of demographic data, changes in the local population, and the land-use pattern in the study area, as well as any other significant developments in the area and thus social character over time. The profiling process is a combination of secondary and primary research, site visit and consultation.

The broad profiling will typically include descriptions regarding the following:

- The social trends and current conditions;
- The land-use in the area;
- The demographical profile and social characteristics of the host community;
- Other potential developments in the area;
- The local and regional economy; and
- Potential economic links between the proposed project and its environs.

6.7 Projecting Anticipated Impacts

The baseline assessment indicates the current reality in the social and related aspects of the affected environment. A baseline assessment is necessary to enable a logical and theoretically sound analysis of social impacts. It forms part of the process of identifying important cause-and-effect relationships and a comparative framework for anticipated changes and impacts.

The following criteria were used to assess the anticipated impacts associate with and suitability of each site for the proposed Khulu TSF:

- Location and socio-economic characteristics of the site;
- Land-use and surrounding land-use that could be incompatible or compatible with the proposed development;
- Residential proximity to the site;
- Visibility of the site to surrounding land-users and/or sensitive receptors;
- Distance from existing mining infrastructure to the sites;
- Movement of workers to and from the site;
- Safety and Security Issues;
- Existing access roads; and
- Areas where servitudes are held.

7. EVALUATION CRITERIA

The evaluation of impacts is conducted in terms of the criteria detailed in Table 2 to Table 7. The various environmental impacts and benefits of this project are discussed in terms of impact status, extent, duration, probability, and intensity. Impact significance is regarded as the sum of the impact extent, duration, probability and intensity. A numerical rating system has been applied to evaluate the significance of the impacts. Therefore, an impact magnitude and significance rating is applied to rate each identified impact in terms of its overall magnitude and significance (Table 7).

In order to adequately assess and evaluate the impacts and benefits associated with the project, it was necessary to develop a methodology that would scientifically achieve this and to reduce the subjectivity involved in making such evaluations. To enable informed decision-making, it is necessary to assess all legal requirements and clearly defined criteria in order to accurately determine the significance of the predicted impact or benefit on the surrounding natural and social environment.

7.1 Status

The nature or status of the impact is determined by the conditions of the environment prior to construction and operation. A discussion on the nature of the impact will include a description of what causes the effect, what will be affected and how it will be affected. The nature of the impact can be described as negative, positive or neutral.

Table 2: Status of Impact

Rating	Description	Quantitative Rating
Positive	A benefit to the receiving environment	P
Neutral	No cost or benefit to the receiving environment	-

Negative	A cost to the receiving environment	N

7.2 Extent

The extent of an impact is considered as to whether impacts are either limited in extent or if it affects a wide area or group of people. Impact extent can be site specific (within the boundaries of the development area), local, regional or national and/or international.

Table 3: Extent of Impact

Rating	Description	Quantitative Rating
Low	Site Specific; Occurs within the site boundary	1
Medium	Local; Extends beyond the site boundary; Affects the immediate surrounding environment (i.e. up to 5 km from the Project Site boundary).	2
High	Regional; Extends far beyond the site boundary; Widespread effect (i.e. 5 km and more from the Project Site boundary).	3
Very High	National and/or international; Extends far beyond the site boundary; Widespread effect	4

7.3 Duration

The duration of the impact refers to the time scale of the impact or benefit.

Table 4: Duration of Impact

Rating	Description	Quantitative Rating
Low	Short term; Quickly reversible; Less than the project lifespan; 0 – 5 years.	1
Medium	Medium term; Reversible over time; Approximate lifespan of the project; 5 – 17 years.	2
High	Long term; Permanent; Extends beyond the decommissioning phase; >17 years	3

7.4 Probability

The probability of the impact describes the likelihood of the impact actually occurring.

Table 5: Probability of Impact

Rating	Description	Quantitative Rating
Improbable	Possibility of the impact materialising is negligible; Chance of occurrence <10%.	1
Probable	Possibility that the impact will materialise is likely; Chance of occurrence 10 – 49.9%	2
Highly Probable	It is expected that the impact will occur; Chance of occurrence 50 – 90%.	3
Definite	Impact will occur regardless of any prevention measures; Chance of occurrence >90%.	4
Definite and Cumulative	Impact will occur regardless of any prevention measures; Chance of occurrence >90% and is likely to result in in cumulative impacts	5

7.5 Intensity

The intensity of the impact is determined to quantify the magnitude of the impacts and benefits associated with the proposed project.

Table 6: Intensity of Impact

Rating	Description	Quantitative Rating
Maximum Benefit	Where natural, cultural and / or social functions or processes are positively affected resulting in the maximum possible and permanent benefit.	+5
Significant Benefit	Where natural, cultural and / or social functions or processes are altered to the extent that it will result in temporary but significant benefit.	+4
Beneficial	Where the affected environment is altered but natural, cultural and / or social functions or processes continue, albeit in a modified, beneficial way.	+3
Minor Benefit	Where the impact affects the environment in such a way that natural, cultural and / or social functions or processes are only marginally benefited	+2
Negligible Benefit	Where the impact affects the environment in such a way that natural, cultural and / or social functions or processes are negligibly benefited.	+1
Neutral	Where the impact affects the environment in such a way that natural, cultural and / or social functions or processes are not affected.	0
Negligible	Where the impact affects the environment in such a way that natural, cultural and / or social functions or processes are negligibly affected	-1
Minor	Where the impact affects the environment in such a way that natural, cultural and / or social functions or processes are only marginally affected.	-2
Average	Where the affected environment is altered but natural, cultural and / or social functions or processes continue, albeit in a modified way.	-3
Severe	Where natural, cultural and / or social functions or processes are altered to the extent that it will temporarily cease.	-4
Very Severe	Where natural, cultural and / or social functions or processes are altered to the extent that it will permanently cease.	-5

7.6 Significance

The impact magnitude and significance rating is utilised to rate each identified impact in terms of its overall magnitude and significance.

Table 7: Impact Magnitude and Significance Rating

Impact	Rating	Description	Quantitative Rating
Positive	High	Of the highest positive order possible within the bounds of impacts that could occur.	+12-16
	Medium	Impact is real, but not substantial in relation to other impacts that might take effect within the bounds of those that could occur. Other means of achieving this benefit are approximately equal in time, cost and effort	+6-11
	Low	Impacts is of a low order and therefore likely to have a limited effect. Alternative means of achieving this benefit are likely to be easier, cheaper, more effective and less time-consuming	+ 1–5
No Impact	No Impact	Zero Impact	0
Negative	Low	Impact is of a low order and therefore likely to have little real effect. In the case of adverse impacts, mitigation is either easily achieved or little will be required, or both. Social, cultural, and economic activities of communities can continue unchanged.	-1-5
	Medium	Impact is real, but not substantial in relation to other impacts that might take effect within the bounds of those that could occur. In the case of adverse impacts, mitigation is both feasible and fairly possible. Social cultural and economic activities of communities are changed but can be continued (albeit in a different form). Modification of the project design or alternative action may be required	-6-11
	High	Of the highest order possible within the bounds of impacts that could occur. In the case of adverse impacts, there is no possible mitigation that could offset the impact, or mitigation is difficult, expensive, time-consuming or a combination of these. Social, cultural and economic activities of communities are disrupted to such an extent that these come to a halt.	-12-16

8. BASELINE DESCRIPTION OF THE RECEIVING ENVIRONMENT

8.1 Sekhukhune District

The Sekhukhune District Municipality (SDM) was established in December 2000. It consists of five Local Municipalities, namely Elias Motsoaledi, Ephraim Mogale, Greater Tubatse, Fetakgomo, and Makhuduthamaga Local Municipalities. The district is situated in the Limpopo province, to the northwest of Mpumalanga and within the southern section of the Limpopo Province. The SDM covers an area of approximately 13 264 m^2. Most of the area is typical rural as only 5% of Sekhukhune population lives in urban areas.

The main urban centres are Groblersdal, Marble Hall, Burgersfort, Jane Furse, Ohrigstad, Steelpoort and Driekop. Outside these major towns, one finds almost 605 villages which are generally sparsely populated and dispersed throughout the district[1].

8.2 Study area

The Dwarsrivier Chrome Mine (DCM) is situated on Portion 1 (Remaining Extent) and Portion 0 (Remaining Extent) of the farm Dwarsrivier 372 KT and Portion 4 (a Portion of Portion 3) of the Farm De Grootteboom 373 KT, approximately 25 km south of the town of Steelpoort in the Limpopo Province. DM is 60km northwest of Lydenburg, and 63km northeast of Roossenekal. The DCM is accessed from the R577. The area falls under the jurisdiction of the Sekhukhune District and the Fetakgomo Tubatse Local Municipality (FTLM).

According to the recent official demographic survey results (2016), the FTLM has a total population of 490 381 people (Statistics South Africa Community Survey, 2016).

There is overwhelming strong statistical evidence that the population is growing at an exponential rate. There are more females 251 923 (51%) than males 238 458 (49%) in the population pyramid. Of the total population within the FTLM, 223 214 are young people. The youth thus represent 46% of the total population figure[2].

The DCM falls within Ward 27 of the FTLM and has a population of 12 527 (Statistics from 2011)[3]. Ward 27 has the following villages: Moshate, Tsakane, Kalkontein, Mabelane, Makakatela, Kutullo A&B, Shushumela & Matepe, Kutullo C&D, Dithamaga and Madibeng[4].

The main economic sectors within FTLM include agriculture, mining and quarrying, trade, tourism, manufacturing, general government, community, social and personal services, catering and accommodation[5].

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[1] www.sekhukhunedistrict.gov.za

[2] www.fgtm.gov.za

[3] www.wazimap.co.za

[4] Draft 2018/19 IDP/Budget for Fetakgomo Tubatse Local Municipality

[5] Fetakgomo Tubatse Local Municipality: Draft 2018/19 IDP/Budget for Fetakgomo Tubatse Local Municipality

8.3 Social Profile

8.3.1 *Population Figures*

The following table provides an outline of the population figures in the affected ward and how it compares to those of the municipality, district and province.

Table 8: Population figures[6]

POPULATION FIGURES				
Ward	**Population**	**People per km²**	**Number of Households**	**% Under 20 Years Age Group**
Ward 27	12 527	18.9 km²	2 727	48%
FTLM	489 902	85.9 km²	125 363	42%
Sekhukhune District	1 169 762	85.7 km²	290 526	45%
Limpopo	5 799 990	46.1 km²	1 601 083	44%

The population figures indicate a study area which is not densely populated compared to the rest of the Fetakgomo Tubatse Local Municipality. The percentage of youth under the age of 20 years comprises approximately half of the population sector within Ward 27. The FTLM has a lower percentage of people within the under 20 years age category, but this figure still remains high. Employment creation within the municipality and especially within the ward, over the long term, is thus critical.

Ward 27 constitutes 1% of the total FTLM population[7].

8.3.2 *Education Levels*

Based on information received, the percentage within Ward 27 that achieved Grade 12 compares much lower to the levels of the FTLM. The levels of higher education achieved in the study area are also lower than those of the FTLM, the district and province.

Table 9: Education Levels[8]

MUNICIPALITY / WARD	***NO SCHOOLING***	***GRADE 12***	***HIGHER EDUCATION***
Ward 27	16%	19%	1%
FTLM	16%	26%	4%
Sekhukhune District	16%	26%	4%
Limpopo	14%	28%	6%

[6] www.wazimap.co.za (Census 2011)

[7] Draft IDP/Budget 2021/22-2023/26 for Fetakgomo Tubatse Local Municipality

[8] www.wazimap.co.za (Community Survey 2016)

8.3.3 *Employment and Income Levels*

The table below shows relatively higher average income levels in the Ward and FTLM compared to the Sekhukhune District. This could be due to the various mining activities in the area responsible for various employment opportunities.

Table 10: Employment and Income Levels

EMPLOYMENT AND INCOME LEVELS			
WARD	**Employed**	**Other not economically active**	**Average Annual household income**
Ward 27	22.1%	43%	R29 400
FTLM	23%	47%	R57 500
Sekhukhune District	20.9%	50%	R14 600
Limpopo	27.4%	49%	R30 000

8.3.4 *Skill levels of the labour force*

According to the FTLM IDP, there is a shortage of relevant skills among locals which results in a situation where skills for the mining industry are sourced from outside the province. This hampers the municipality's job creation efforts[9]. Skills shortages are thus a challenge that needs to be overcome.

8.3.5 *Infrastructure*

The majority of residents within the FTLM live in formal dwellings (76%), which is approximately the same as within the Sekhukhune District. The area where the proposed development is situated (Ward 27), however has only 67% living within formal dwellings and 22.5% of the residents that live within informal dwellings. The latter is almost double the figure of those within the FTLM and the Sekhukhune District[10].

FTLM can be seen as a water stressed municipality. According to the community survey of 2016, 58 255 households have access to piped water and 67 208 households have no access to piped water. Of the 39 wards in the FTLM, almost all the villages source water from boreholes, rivers, dams and tanks. The main reasons for this situation is illegal water connections, limited communal and aging infrastructure, drought, lack of financial resources,

[9] Draft 2018/19 IDP/Budget for Fetakgomo Tubatse Local Municipality

[10] www.wazimap.co.za

the topography of the area, as well as the number of informal and scattered settlements through the municipal area.[11]

Within Ward 27, 62% of the households obtain their water from the river, but 19.5% of the households do receive their water from a regional or local water service provider. The majority of households (72.4%) also use pit latrines[12].

Villages within Ward 27 all have access to electricity services, although there are some households that still need to be connected. The area however experiences frequent power outages[13].

8.4 Economic activities

The FTLM has the following investment opportunities:

- mining investment;
- land availability;
- tourism;
- funding source from private sector; and
- job creation from infrastructure investment.

Mining still presents the largest opportunity in the area and the mining activities and natural resources available in the area have created a definite potential to develop tourism and thereby to diversify the economic base of the municipality[14].

The mining industry is furthermore the municipality's leading job creator and key economic growth driver. With all major mining houses fully represented in the municipality, locals pin their hopes for jobs and income security in this sector. The mining sector accounts for 34% of the Municipality's total GVA and 54% of the total labour force in the formal sector. The job absorption patterns during a 12-year review period in the sector shows that year 2012 witnessed the highest number of jobs (1833) created.

The agriculture sector in the FTLM is still emerging and heavily under-invested. Lack of mechanisation makes smallholder farming one of the smallest contributors to the municipality's economic growth.

The manufacturing sector covers the manufacturing of goods, products and beverages. It also comprises the production, processing and preservation of meat, fish, fruit, vegetables, oils and dairy products; grain mill, starches and tobacco products; textile products; spinning, weaving;

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[11] Draft 2018/19 IDP/Budget for Fetakgomo Tubatse Local Municipality

[12] www.wazimap.co.za

[13] Draft 2018/19 IDP/Budget for Fetakgomo Tubatse Local Municipality

[14] Draft 2018/19 IDP/Budget for Fetakgomo Tubatse Local Municipality

and petroleum products and nuclear fuel. This sector has a vast potential as job creator but is still in its infancy.

With regards to the tourism sector, it was noted that the unique selling benefits of local heritage sites and other tourism facilities in the municipality are not effectively profiled and marketed. The tourism sector is further being overshadowed by mining to the extent that more strategic focus is unevenly invested in the latter at its expense.

The area surrounding the mining site is characterised by mining activities of other chrome and platinum mines. Some of the neighbouring farms in the area are further used for livestock grazing and the production of vegetables, lucerne and cotton.

9. CHARACTERISTICS OF POTENTIAL TSF SITES

The following provides an overview of the characteristics of the potential sites for the Tailings Storage Facility (TSF):

9.1 Site B

Site B would be 20ha and the TSF is planned to be 37 m in height. Site B is located to the south of the road crossing of the R577 and the Richmond Road. The latter is used as access road to the Two Rivers Platinum Mine. Site B is thus located to the east of the TRP access road and west of the R577. It is approximately 1.3 km north of the existing DCM plant.

Site B is located within an area where various other mining infrastructure is situated. Mining activities of DCM and TRP are to the south, west, east and southwest of the proposed site location. Power lines traverses to the east of site B. These lines are between 120m and 150m from the R577 and alongside the R577. It is anticipated that the detailed design will be able to accommodate the electricity infrastructure and that it would not be affected by the proposed TSF. Haulage would have to be undertaken beneath the power lines.

The change in the land use due to the development of the proposed Khulu TSF on Site B fits the surrounding land-use in the area which include mining activities and mining infrastructure. Site access would also be easily available from the existing mining activities and the R577 or Richmond Road.

The following figures provides a Google Earth view of Site B from the R577 (taken from the east) (Refer to figure 6) and from the Richmond access road to the TRP (taken from the west) (Refer to figure 7).

Figure 6: Google Earth view of Site B from the R577 (June 2021)

Figure 7: Google Earth view of Site B from the TRP access road (June 2021)

9.2 Site C

Site C is 28 Ha in extent and situated approximately 1.5 km to the south west of the R577 and office complex, and to the south of the processing plant. The facility proposed on Site C would be 29 m in height. Access to the site would be obtained via an existing gravel road from the R577 from the main administrative buildings of DCM.

The following photograph indicates the view of the northern section of the area of the proposed site. The photograph was taken from the eastern side of the site area.

Figure 8: Site C (December 2018)

The existing mining activities of DCM are situated to the north of the site. Mining activities (tailings facility) of Two Rivers Platinum Mine are situated to the west of the proposed site. Expansion to the west will thus not be possible. Site C thus falls within an area that is currently used for mining activities, although the site itself seems to consist of relatively undisturbed natural vegetation. Infrastructure on site includes an Eskom servitude, TRP pipeline and power line.

No residential areas are in close proximity to Site C. The nearest residential settlement is approximately 10-12 km away along the R577. The facility is not in close proximity to the existing plant and office complex and limited air quality impacts and noise intrusions are anticipated on any receptors.

The Heritage Assessment found that there are graves located on site. This would have to be relocated if this site would be used.

9.3 Site D

Site D is 21 Ha in extent and situated approximately 1 km to the east of the R577. The facility proposed on Site D would be 49 m in height. Access to the site would be obtained via an existing gravel road from the R577 passing administrative buildings of DCM or the new access crossing between the plant and North mine.

The following photograph indicates the view to the proposed site in a northerly direction. The photograph was taken from the existing access road.

Figure 9: Site D (December 2018)

10. IMPACTS ASSOCIATED WITH THE CONSTRUCTION PHASE

The following section provides a description of the social impacts anticipated to occur during the construction or build-up period of the proposed Khulu TSF and capital projects. The timeframe for the build-up period for the various projects is of a short duration and construction activities associated with the different projects will overlap.

The construction of the TSF will last 20 months (e.g. Q1 of 2022 until Q1 of 2023) and will be constructed as the first phase of the project. Project 2 (Diesel and emulsion batching area), Project 3 (Main parking extension) and Project 4 (Widening of the access road between South Shaft/Main Offices and Plant) will commence (e.g. all to be undertaken from Q2 2022 until 2022 Q3). These three projects will be completed in approximately eight months. Project 5 (Access crossing between South and North Mine) will be undertaken within an eighteen month period from e.g. 2022 Q2 until 2022 Q4.

The construction phase will include land and footprint clearances, topsoil stripping and stockpiling, and the establishment of the surface infrastructure.

10.1 Employment and income opportunities during build-up phase

For the construction of the Khulu TSF, a total of 64 construction workers would be employed for the whole duration. Forty of these would be contractors. From the total employees required, 12 would be medium skilled (workers with technical qualifications up to grade 12) and 16 would be low skilled (grade 10 and lower).

Furthermore, some outside contractors will be involved with specific projects such as the construction of the diesel and batching areas (5 individuals on a part-time basis); main parking extension (5 individuals on a part-time basis), widening of the existing access road (10 full time contractors) and new access crossing (16 full time contractors).

A section of the workforce would consist of low skilled workers (e.g. general construction labourers), as well as medium skilled site operators and skilled supervisors.

As existing mining is taking place at DCM, some of the above employment opportunities will be filled by existing employees. It is anticipated that a total of 36 new employment positions will be created which will result in positive economic impacts. DCM is further committed to source all the individuals falling within the medium and lower skilled categories from the local labour pool, and as many as possible falling within the high skilled category. To enhance the benefit to the local communities, it is recommended that local labour (from within the local municipal area) be procured as far as possible for all levels of skills.

Herewith a summarised table indicating the anticipated employment profile during the construction phase:

Table 11: Employment Profile during construction phase

Employment	**PROJECT 1: KHULU TSF**	**PROJECT 2: BATCHING AREAS**	**PROJECT 3: PARKING EXTENSION**	**PROJECT 4: WIDENING OF ACCESS RD**	**PROJECT 5: ACCESS CROSSING**
Permanent full-time	24	0	0	0	0
Contract full time	40	0	0	10	16
Seasonal/part-time	0	5	5	0	0
Total	***64***	***5***	***5***	***10***	***16***
High skilled (*Workers with academic qualifications*)	12	0	0	0	1
Medium skilled (*Workers with technical qualifications up to grade 12*)	12	5	5	3	5
Low skilled (*Grade 10 and lower*)	16	0	0	7	10

The socio-economic benefit of the build-up area can have limited short-term positive impacts and would possibly be similar to what is currently being experienced with the existing mining operation. It is not anticipated that the build-up period associated with the Khulu TSF and capital projects would necessarily create significant business opportunities within the local economy.

As indicated under Section 8.3.1, the population in the municipal area consists of a large proportion of youth. It is thus likely that some of these young jobseekers living in the various settlements in close proximity to DCM can move closer to, or gather at the mining site, should they become aware of new construction related activities being undertaken.

Due to the relative short timeframe and extent of the build-up period, as well as the expected number of workers involved, it is however highly unlikely that the project would result in large numbers of in-migration of jobseekers and workers to the local area. Therefore, no population change is anticipated as a direct result of the proposed Khulu TSF and capital projects.

The total spending (excluding salaries and wages) during the construction can total approximately R450 million. The majority of this spending will be procured from the local municipal area (80%) and from BEE suppliers (80%). Only 10% or less would be spend on foreign imports. The local benefits and economic spin-offs opportunities are thus substantial.

Table 12: Employment and Income Opportunities

THEME: TEMPORARY EMPLOYMENT AND INCOME OPPORTUNITIES		
	Without mitigation	**With mitigation / enhancement**
Status	Positive (+)	Positive (+)
Extent	Local and regional (3)	Local and regional (3)
Duration	Short term: (1)	Short term: (1)
Probability	Improbable (1)	Probable (2)
Intensity	Beneficial (3)	Beneficial (3)
Significance	Medium (8) +	Medium (9) +
Enhancement: • Prioritise any possible new local labour in the recruitment process as part of the company's own recruitment policy or as part of the contractor management plan and stipulate the procurement of new employees, especially in the medium to lower skilled categories, from the local communities. • Contractual obligations for contractors (if required) should be introduced to use local labour as far as possible where applicable. • Contractors should ensure that workers reside in suitable facilities and not establish informal houses. • Targets for the procurement of capital goods, consumer goods and services should be set and DCM should develop an action plan to meet these targets. • The procurement process should be based on competitive business principles and the quality of services to be rendered, to ensure adherence to standards and to maximise overall welfare.		
Expected areas of impact: Steelpoort, scattered villages in close proximity to DCM, and FTLM area		
Cumulative impacts: • Other mining applications proposed by different applicants within the area, and other companies in the FTLM area could have a cumulative impact on skilled local labour availability and mining construction supplies if not pro-actively managed.		
Residual impacts: None		

10.2 Community Safety and Security

During the construction phase, community safety can be at risk, mainly due the movement of construction vehicles and construction activities (e.g. blasting) affecting the R577 due to the construction of the access crossing underneath the R577 to allow ease of access between the South and the North Mine. Safety hazards to mine personnel would also occur during the construction activities forming part of the extension of the main parking area and widening of the access road between the plant and North Mine, due to the continued movement of mining vehicles on this section of road. These impacts are anticipated to be mitigated by implementing construction related precautionary measures and warning signs/notifications.

The development of the Khulu TSF and batching areas can furthermore create possible safety hazards. On site, mining activities pose safety risks which must be managed according to the relevant Health and Safety Plans of the mine to ensure the safety of workers and adjacent communities. These anticipated impacts will further respond to the environmental monitoring and management measures to be implemented. In terms of the different sites for the Khulu TSF, the following should be noted:

- It is considered that the movement of workers to and from Sites B and D, as well as the movement of equipment during the construction and operational phases would result in limited negative impacts due to the sites' proximity to the existing plant and available roads. Safety and security issues associated with the movement of the personnel can be dealt with by the existing measures put in place by DCM should the internal gravel roads be used. Additional measures might be required if the R577 would be used or where the R577 would be crossed.
- It is considered that the movement of workers to and from Site C, as well as the movement of equipment during the construction would result in limited negative impacts as there is an existing access road to the site. Safety and security issues can be dealt with, but additional measures might be required due to the distance from the existing plant and the access road might have to be upgraded.

The number of construction vehicles, driver conduct, location of the worker accommodation facilities, as well as the actual number of outside construction workers would influence the intensity of the impact.

Table 13: Community Safety and Security

THEME: COMMUNITY SAFETY AND SECURITY		
	Without mitigation	**With mitigation / enhancement**
Status	Negative (-)	Negative (-)
Extent	Local (2)	Local (2)
Duration	Short term (1)	Short term (1)
Probability	Highly probable (3)	Probable (2)
Intensity	Average (3)	Minor (2)
Significance	Medium (9) -	Medium (7) -
Mitigation: • Maximise the use of local labour and contractors where possible by developing a strategy to involve local labour in the construction process to limit the inflow of outsiders. • Construction vehicles must adhere to all mine related safety regulations and drivers must adhere to road regulations. • Drivers and operators must have the necessary qualifications to operate the vehicles and equipment they are assigned to. • Construction vehicles must be in a good working order. Inspections of vehicles, as well as maintenance must be undertaken on a regular basis. • Discussions and approvals with regards to required construction authorisations between DCM and Dept. of Roads and Public Works to be in place. • Warning signs with regards to construction activities to be erected to inform public road users of activities and possible dangers.		
Expected areas of impact: Localised construction sites, R577		
Cumulative impacts: • Possible cumulative impacts if construction activities overlap.		
Residual impacts: None		

10.3 Visual impact and sense of place

Land-uses in the area include mining, natural veld and farming activities which is mainly grazing of livestock. Scattered settlements are also found in the larger study area, but not in close

proximity to the mine. The nearest settlements e.g. Ga-Malekana, Madidimola and Ga-Mampuru are approximately 10 km from DCM.

Various mining related infrastructure, roads, telecommunication infrastructure and so forth is present. The area is not pristine and various disturbances to the natural area characterise the study area.

The main visual impact associated with the construction phase would be the actual construction sites, possible storage of equipment and construction vehicles (laydown area), as well as the disruption of the soil and vegetation. Construction activities associated with the access crossing and the Khulu TSF will be visible to the road users.

These temporary impacts do not necessarily bring new negative impacts to the already disturbed area. There are no sensitive receptors in close proximity to the site, and due to the existing characteristics, the temporary visual impact is rated as low.

Table 14: Visual Impact and Sense of Place

THEME: VISUAL IMPACT AND SENSE OF PLACE		
	Without mitigation	**With mitigation / enhancement**
Status	Negative (-)	Negative (-)
Extent	Local (2)	Local (2)
Duration	Short term (1)	Short term (1)
Probability	Highly probable (3)	Probable (2)
Intensity	Average (3)	Minor (2)
Significance	Medium (9) -	Medium (7) -
Mitigation: • Environmental management of the construction related activities must adhere to environmental regulations and strive towards international best practice. • Rehabilitation of areas to be undertaken as soon as the mining programme allows. • Removal of vegetation should be kept to the minimum. • Removal of protected trees must be avoided, but if removal is required, the necessary permits must from Dept. of Forestry, Fisheries and Environment (DFFE) must be obtained.		
Expected areas of impact: Mining area, localised construction sites, R577		
Cumulative impacts: • Possible cumulative visual impacts if construction activities overlap.		
Residual impacts: None		

10.4 Intrusion Impacts

10.4.1 *Traffic Movement*

Construction activities will mainly include clearing of vegetation and preparation of the different sites, the widening of the access road, the construction of the new access crossing, construction of the infrastructure associated with the diesel and emulsion batching areas and the development of the TSF.

These activities will result in the movement of heavy machinery and vehicles within the boundaries of the site and with some movement of construction vehicles on the provincial road

R577. The number of vehicles involved in the process and equipment details are unknown. The increased noise and dust created by these vehicles, vehicle emissions and increased risk of accidents as well as possible impact on the road surfaces create additional intrusions. These impacts, however, will be intermittent and of a short duration.

Table 15: Traffic Movement

THEME: TRAFFIC MOVEMENT		
	Without mitigation	**With mitigation / enhancement**
Status	Negative (-)	Negative (-)
Extent	Local (2)	Local (2)
Duration	Short term (1)	Short term (1)
Probability	Highly probable (3)	Probable (2)
Intensity	Average (3)	Minor (2)
Significance	Medium (9) -	Medium (7) -
Mitigation: • Unauthorised entry onto the mining area must not be allowed. Access control should continue to be implemented. • Mining areas must be secured and fenced. • All construction vehicles should be in a good condition and adhere to road worthy standards. • Construction vehicles must keep to speed limits. • Limit construction hours to daylight hours e.g., 6am to 6 pm. • Road users must be notified if delays would be experienced due to the access road construction. • Warning signs with regards to the construction activities need to be erected at strategic places along the R577 and must be clearly visible at night. • Road deviations, if required, must be clearly indicated by road signs and must be clearly visible at night		
Expected areas of impact: Mining area, localised construction sites, R577, office buildings		
Cumulative impacts: • Possible cumulative visual impacts if construction activities overlap.		
Residual impacts: None		

10.4.2 *Air quality Impacts*

The air quality impacts refer to dust pollution and emissions.

Mining activities in the larger area can already have negative impacts on the air quality. The construction activities can add to the existing dust pollution impact through vehicular movement on gravel roads and general mining activities. Emissions would include vehicle emissions, emissions from large construction equipment, carbon monoxide, and particulates. Fugitive dust would be caused by the disturbance and moving of soils (clearing, excavating, trenching, backfilling, and dumping). Some temporary negative impacts can occur at the office complex during construction of the main parking extension area.

The main area of impact would be at the mining site. As there are no settlements in close proximity to the sites and the mining activities, the impact is from a socio-economic perspective not anticipated to create risks.

Table 16: Air Quality Impacts

THEME: AIR QUALITY IMPACTS		
	Without mitigation	**With mitigation / enhancement**
Status	Negative (-)	Negative (-)
Extent	Local (2)	Local (2)
Duration	Short term (1)	Short term (1)
Probability	Probable (2)	Probable (1)
Intensity	Average (3)	Minor (2)
Significance	Medium (8) -	Medium (6) -
Mitigation: • Dust suppression (if feasible) to be implemented on the frequently used gravel roads on site, especially during windy conditions. • Construction vehicles should keep to speed limits and must be in good working order. • Inspections of vehicles, as well as maintenance must be undertaken on a regular basis. • Concurrent rehabilitation to be undertaken e.g., establishment of vegetation or covers (where feasible) to assist with dust suppression. • A dust management plan must be strictly implemented.		
Expected areas of impact: Mining area, localised construction sites, office complex		
Cumulative impacts: • Possible overall increase in dust generated due to mining activities and other existing mining activities in the area.		
Residual impacts: Possible continued cumulative dust impact.		

10.4.3 *Noise Impacts*

A Noise Impact Assessment can determine the extent and intensity of the noise impacts. This section aims to highlight the possible social consequences associated with the anticipated noise impacts.

During the construction phase, the various construction activities will generate noise intrusions due to the movement of vehicles, worker conduct, reverse indicator of trucks and loading of material. It is anticipated that the increased noise levels will mainly be experienced on site (office complex area) and that it will not create nuisance impacts off-site. Impacts are deemed low due to the location of the nearest settlements.

From a social perspective though, the noise impacts will have very limited additional negative impacts.

Table 17: Noise Impacts

THEME: NOISE IMPACT		
	Without mitigation	**With mitigation / enhancement**
Status	Negative (-)	Negative (-)
Extent	Local (2)	Local (2)
Duration	Short term (1)	Short term (1)
Probability	Probable (2)	Improbable (1)
Intensity	Average (3)	Minor (2)
Significance	Medium (8) -	Medium (6) -
Mitigation:		

• Mitigation measures with regards to noise impacts as per the EIA Report should be implemented. • All construction vehicles should be in a good condition and adhere to road worthy standards. • Maintenance of vehicles and machinery should be done regularly. • Construction hours must preferably be limited to daylight day hours e.g., 6 am to 6 pm where possible.
Expected areas of impact: Mining area, localised construction sites, R577, Office complex
Cumulative impacts: • Possible overall increase in noise generated due to the mining activities, as well as other mining activities in the area.
Residual impacts: Possible continued impact of cumulative noise

11. IMPACTS ASSOCIATED WITH THE OPERATIONAL PHASE

11.1 Employment Opportunities

The proposed Khulu TSF and capital projects forms part of the DCM's overall objective to ensure continued mining and sufficient supply of their product to chrome markets. The proposed projects will thus assist in achieving this objective as it will improve logistics on site and ensure a proper disposal system for the production requirements.

The draft Scoping Report indicated that there is approximately 1200 permanent and 800 contractor employees in service at DCM. This employment profile will be sustained as the proposed project would allow the operation to meet the existing production capacity. Approximately 24 employees will be directly involved with the operations related to the TSF. No new employment positions will be created as these employees are already employed at DCM.

However, the existing socio-economic benefits created through DCM being a key employer in the area would continue. The social services support as part of the SLP requirements will also continue to be implemented.

As no additional workers are anticipated, the inflow of jobseekers is also anticipated to be of limited significance.

Table 18: Continuation of employment and income opportunities

THEME: CONTINUATION OF EMPLOYMENT AND INCOME OPPORTUNITIES		
	Without mitigation	**With mitigation / enhancement**
Status	Positive (+)	Positive (+)
Extent	Local (2)	Local and regional (3)
Duration	Medium term (2)	Medium term (2)
Probability	Highly probable (3)	Highly probable (3)
Intensity	Beneficial (3)	Beneficial (3)
Significance	Medium (10) +	Medium (11) +
Enhancement: • The procurement of locals should receive preference if there is any need for additional employees. The ideal objective should be to reach 100% recruitment of additional/ new unskilled labour from local communities where skills are locally available.		

Expected areas of impact: FTLM area and possibly beyond
Cumulative impacts: • Other mining activities in the area.
Residual impacts: Continued employment

11.2 Local Procurement

Existing employees would continue to be responsible for the overall mining activities. Limited additional temporary workers could over time be required for specific tasks associated with the proposed Khulu TSF and capital projects. When that occurs, new mining activities can then be allocated to appointed specialist contractors.

Even if limited procurement is foreseen, this variable is still regarded as positive, due to the indirect impacts of DCM's mining activity on the local economy through the creation of possible business opportunities (e.g. local service industry) and local procurement of material, services and equipment.

Table 19: Local Procurement

THEME: LOCAL PROCUREMENT		
	Without mitigation	**With mitigation / enhancement**
Status	Positive (+)	Positive (+)
Extent	Local (2)	Local and regional (3)
Duration	Medium term (2)	Medium term (2)
Probability	Highly probable (3)	Highly probable (3)
Intensity	Beneficial (3)	Beneficial (3)
Significance	Medium (10) +	Medium (11) +
Enhancement: • Targets for the procurement of capital goods, consumer goods and services should be set and DCM can develop an action plan to meet these targets. These plans could include, but are not limited to, the development of Economic Empowerment (EE) policies, procedures and guidelines, as well as the development of a database of local small businesses (entrepreneurs and SMME's) • The procurement process should be based on competitive business principles and the quality of services to be rendered, must ensure adherence to standards while maximising overall welfare of the local communities. • Contract executions by SMMEs should be strictly monitored to determine whether SMMEs require assistance with regards to general business principles, financial management, management of stock, competitive costing (pricing), and marketing of their businesses. • Enterprise development is a key enhancement measure in this regard. The proponent should assist small businesses and/or SMME's to develop to a certain level. Such measures recommended could include the following: • The establishment of joint ventures between small businesses and established companies with relevant experiences with regards to tender processes can be considered; • Flexible payment systems can be considered to assist smaller businesses in terms of expenditure, but such a system must be strictly controlled, • An audit of existing local enterprises that could provide services, goods and material should be undertaken with the assistance of local leaders and community representatives, as well as local business structures		
Expected areas of impact: FTLM area and beyond		
Cumulative impacts: • Local procurement in the area as a result of various mining operations.		

Residual impacts: Capacity building amongst SMMEs

11.3 Socio-Economic Development

The socio-economic impact of the proposed projects would be based on the mine's continued contribution to the Gross Geographical Product (GGP) and the number of direct (continued employment at the mine) and indirect jobs that would be created. Therefore, except for ongoing direct employment, that would generate income and increase local spending, people living in the vicinity of the study area is also expected to benefit by the earnings of those employed by the mine and the local buying power in the area.

Through employment and income generation during the mining processes, some economic benefits to the region and local communities therefore accrue. The mine would continue to contribute to the local economy through its employee wages, procurement of local contractors and services, purchasing of water and electricity and through payment of taxes to the FTLM.

DCM, through their mining activities, is involved in various Local Economic Development Initiatives linked to the Integrated Development Plan (IDP) of the FTLM, as well as other government initiatives. These activities would thus continue, and the constant positive socio-economic impacts thereof would remain to benefit of the local communities.

Table 20: Socio-Economic Development

THEME: SOCIO-ECONOMIC DEVELOPMENT		
	Without mitigation	**With mitigation / enhancement**
Status	Positive (+)	Positive (+)
Extent	Local and regional (3)	Local and regional (3)
Duration	Medium term (2)	Medium term (2)
Probability	Highly probable (3)	Highly probable (3)
Intensity	Beneficial (3)	Significant benefit (4)
Significance	Medium (11) +	High (12) +
Enhancement: • DCM, through their SLP, must continue to provide skills development opportunities for employees that 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. • Develop a database of SMME's for the procurement of goods and services that could potentially be outsourced to the local community. • DCM to continue to adhere to the Social and Labour Plans as per the Regulation 46 of the Mineral and Petroleum Resources Development Act (Act 28 of 2002) and the Mining Charter (2018).		
Expected areas of impact: FTLM area and beyond		
Cumulative impacts: • Socio-economic development in the area as a result of various mining operations.		
Residual impacts: Up-skilled labour force (positive)		

11.4 Capacity Building

Although education and training are mainly the responsibility of government, there is increased pressure on the business sector in South Africa to increase the development and skills of their workforce.

DCM is involved in capacity building and training. Further to these focus areas, the company also concentrate on local employment creation and poverty alleviation, as well as environmental management, rural development and the provision of infrastructure.

The above-mentioned inputs would continue if DCM is successful in sustaining their mining operations in the area. DCM has thus played an important role in the area in this regard and commits to continue with these efforts which would benefit the local communities within the FTLM area.

Table 21: Capacity Building

THEME: CAPACITY BUILDING		
	Without mitigation	**With mitigation / enhancement**
Status	Positive (+)	Positive (+)
Extent	Local and regional (3)	Local and regional (3)
Duration	Medium term (2)	Medium term (2)
Probability	Highly probable (3)	Highly probable (3)
Intensity	Beneficial (3)	Significant benefit (4)
Significance	Medium (11) +	High (12) +
Mitigation: • DCM should continue with a Human Resources Development (HRD) strategy as part of the Social and Labour Plan (SLP). The focus should remain of career development programmes, bursaries, learnership programmes, skills development and training. • Learnership programmes should preferably focus on individuals from the core and affected areas in close proximity to DCM to maximise the long-term employment opportunities of these local community members. • Local goods and services should be used as far as possible and therefore contractual requirements for contractors to use local goods and services should be implemented as far as possible • Local Economic Development initiatives should continue		
Expected areas of impact: FTLM area and beyond		
Cumulative impacts: • Capacity building amongst community members as a result of various mining operations.		
Residual impacts: Up-skilled labour force		

11.5 Impact on Sense of Place

The social impact associated with the impact on the sense of place relates to the change in the landscape character and visual impact associated with the proposed development.

Mining activities, stockpiles, waste rock dumps, tailings facilities and associated infrastructure are usually perceived to be visually unsightly. The location of the proposed Khulu TSF and associated infrastructure is within an area characterised by long term historical mining

activities, with various different infrastructural developments nearby such as roads, mining activities, conveyor belts, transmission lines, and so forth. No specific land-use can be linked to the TSF site options.

The following must be noted regarding the different Khulu TSF site locations:

- Site B has previously been used for farming activities, although no farming is currently being undertaken within the area. The site is situated within an area characterised by mining infrastructure. Although Site B would be highly visible from the R577 and the Richmond Road, the proposed TSF will blend in with the existing overall sense of place, as the area is already disturbed by existing mining activities. The development of the TSF will thus not create a new impact on the sense of place. The area where site B is proposed is currently not used for other purposes e.g. farming, and therefore one can conclude that no significant land-use sterilisation would occur.
- With regards to Site C, some visual impacts on neighbouring landowners/operators could be possible. As there is existing mining infrastructure and associated activities undertaken in the area, the proposed TSF at Site C would, however, not result in visual impacts that differ from the existing mining activities in the area. The hilly area could provide some sort of visual buffer.
- Graves are present on Site C. These would have to be relocated if Site C would be used for the construction of the TSF. This could have an impact on the family members and the way in which they experience the sense of place associated with the graves.
- At Site D, there are existing mining activities to the north, which are visible. The site appears to be covered by natural vegetation. A distribution line servitude runs to the south of the site. Existing mining activities and infrastructure are also situated to the south of the access road and to the south of the site (existing tailings facility). The area to the east of the proposed site is the property of the De Grooteboom Mine. Site D thus falls within an area currently used for mining activities. It is, however, anticipated that the tailings facility, if constructed on Site D, could be highly visible to the users of road R577. The mountain could provide some visual mitigation to the view from the north. As there are existing mining infrastructure and associated activities undertaken in the area, the proposed TSF at Site D would not result in new visual impacts, but would rather add to the existing visual impacts.

Site C would have limited visual impacts due to the distance of these sites to the public road and office complex. Sites B and D would be visible for road users of the R577. Site B would also be visible to road users that access the Two Rivers Platinum Mine complex. Considering the overall existing sense of place with the mining infrastructure present in the area, the negative impacts for Sites B and D are deemed medium and for Site C this is deemed low.

With regards to the overall impact of the Khulu TSF and the capital projects on the sense of place, there would be additional impacts associated with the different projects, although it would not significantly scar the existing visual characteristics of the environment.

Table 22: Impact on Sense of Place

THEME: IMPACT ON SENSE OF PLACE		
	Without mitigation	**With mitigation / enhancement**
Status	Negative (-)	Negative (-)
Extent	Local (2)	Local (2)
Duration	Medium term (2)	Medium term (2)
Probability	Highly probable (3)	Probable (2)
Intensity	Average (3)	Average (3)
Significance	Medium (10) -	Medium (9) -
Mitigation: • Mining areas should be rehabilitated as soon as the Mining Works Programme allows. • Un-rehabilitated and poorly rehabilitated mining areas must not be allowed to remain. • Environmental management of the mining activities must adhere to environmental regulations and strive towards international best practice. • The eradication of alien invasives, aimed at ensuring the integrity of the biodiversity, should form part of the mitigation to limit further negative impacts on the overall sense of place. • Placement of lighting at infrastructure should be optimally placed with the least negative visual impacts possible. • The design of the TSF must consider the visual impacts and aim to lessen this by attending to the slope angles/steepness and possible landscaping around the facility (e.g. tree barrier line).		
Expected areas of impact: Khulu TSF sites, R577 and Richmond Road		
Cumulative impacts: • Various mining activities and infrastructure currently in the area.		
Residual impacts: Visual impact of various mining infrastructure		

11.6 Safety and Security Related Impacts

The production capacity associated with the proposed Khulu TSF project and the capital projects would remain approximately similar to the current situation and it is therefore *not* anticipated that the transportation of material or products would escalate. However, the continuous movement of mining related vehicles transporting goods and materials on the local roads can still continue to create safety and security risks.

Construction of the access crossing between the plant and North Mine, as well as the widening of the access road between the South Shaft/Main Offices and Plant would reduce these risks and create a positive impact in this regard. The negative impact prior to mitigation can thus be changed to a medium positive impact.

The method to be used at the Khulu TSF involves dry stacking by means of the filter cake which is of a solid content. This method minimises the risk of tailings dam failures and can lessen possible seepage significantly. From a socio-economic perspective this method will thus limit safety and security risks, as well as health risks.

Table 23: Safety and Security

THEME: SAFETY AND SECURITY		
	Without mitigation	**With mitigation / enhancement**
Status	Negative (-)	Positive (+)
Extent	Local (2)	Local (2)
Duration	Medium term (2)	Medium term (2)
Probability	Probable (2)	Probable (2)
Intensity	Minor (2-)	Minor (2+)
Significance	Medium (8) -	Medium (8) +
Mitigation: • Should site B be used for the Khulu TSF development, access should be from within the mining area. Access points from the R577 must be avoided. • A Fire/Emergency Management Plan should be developed and implemented, if not yet in place. It would be important to regularly review the functionality and efficiency of such a plan in conjunction with the local emergency teams, mine management and affected communities as well as neighbouring landowners. • Appropriate firefighting equipment should be on site and workers should be appropriately trained for firefighting • Warning signs would have to be posted to alert residents and road users to possible dangers associated with mining related traffic and activities. • Access to the mine via the new parking extension should consider all safety and security measures and have as little impact on the traffic on the R577 as possible		
Expected areas of impact: Mining area and preferred site for Khulu TSF		
Cumulative impacts: • Cumulative impacts as a result of various mining operations in the area.		
Residual impacts: Medium positive impact with regards to the movement of mining related vehicles.		

11.7 Health Related Risks

During the operational phase dust impacts are anticipated due to general mining activities and vehicles travelling on the access and haul roads. The dust concentrations as a result of this movement are not anticipated to reach residential areas and the impact would possibly be localised on site.

Fugitive dust from stockpile areas and waste rock dumps are also of concern. Windblown dust from these facilities will vary according to the season, with possible higher levels and frequency during the windy months. The probability and intensity of these possible impacts would further depend on the wind directions and the proximity of sensitive receptors. The nearest residential area is approximately 10 km to the north and east of the mining area.

Should there be a possible increase in the air pollution (dust), these sensitivities should be adequately dealt with and be taken into account in the monitoring processes stipulated as part of the EMPr.

In the event that sensitive receptors are affected (worst case scenario), based on dust fallout rates, the necessary mitigation measures as stipulated through the Air Quality specialist study must be implemented. The rating below is based on the general air quality impacts usually experienced with mining projects and the proximity of sensitive receptors in the study area.

Emissions would include vehicle emissions (carbon monoxide and nitrogen oxide) and emissions from large construction equipment.

Industrial, solid and hazardous waste would be created during the mining operations. As is currently the case, these different types of waste should continue to be responsibly disposed of to avoid any health-related impacts in this regard. Storing of diesel and emulsion can create health related risks. As mitigation, the emulsion will be stored in underground tankers. The majority of the pipelines will further be underground to limit risks in this regard and possible spills.

The Khulu TSF, as indicated above would include dry stacking. This method can minimise health risks usually associated with conventional tailings facilities. Surface water runoff and possible seepage are still possible and can contaminate water resources. The designs should avoid such pollution in order to avoid public health impacts due to the potential impact on the water quality. It should also again be noted that the nearest residential settlement is approximately 10 km away from the mining activities.

In mining areas there are further concerns relating to migrant employees bringing health risks, and nowadays the threat of Covid-19 infection, to mining areas or small towns. The FTLM area is already characterised by vulnerable households and inadequate public health services that cannot always effectively deal with the health risks associated with the pandemic. It will remain the responsibility of DCM to continue their support to their employees and surrounding communities to reduce vulnerability and to implement the required Covid-19 Protocol.

Table 24: Health Related Risks

THEME: HEALTH RELATED RISKS		
	Without mitigation	**With mitigation / enhancement**
Status	Negative (-)	Negative (-)
Extent	Local (2)	Local (2)
Duration	Medium term (2)	Medium term (2)
Probability	Highly Probable (3)	Probable (2)
Intensity	Average (3)	Minor (2)
Significance	Medium (10) -	Medium (8) -
Mitigation: • The Mine Health and Safety Act (Act No 29 of 1996), standards stipulated in SANS 10286, NEMA and related regulations and standards must be adhered to. • Vehicles and equipment must be in good working order and must be regularly serviced. • Infrastructure e.g. pipelines must be regularly inspected and maintained to avoid spillages. • Mining activities should adhere to all the relevant environmental and health guidelines and should be undertaken in accordance with the EMP • The TSF design should ensure that contaminated surface water runoff do not contaminate other water sources and that no seepage occurs. • Extracting water from the slurry/slimes will limit the water content of the TSF. • Dust suppression methods along haul roads should be continued to be implemented • DCM must continue to distribute information with regards to health matters and nutrition to its workers and surrounding communities • Storing of emulsion and diesel must not be in close proximity to any flammable materials.		

• The SLP should make provision for addressing any possible direct health related risks and providing a supporting role to minimise the vulnerabilities of the communities, without having to take over the role of the local health services and municipality. • On site, all the appropriate health, hygiene and distancing measures aimed at protecting the employees' safety and health, must be implemented. • DCM can investigate ways to support to the local clinics through their community support programmes and SLP initiatives. • Educational videos on COVID-19, and general health and hygiene measures associated with the pandemic should be provided to employees
Expected areas of impact: Mining area, access and haul roads
Cumulative impacts: • Other mining activities in the area.
Residual impacts: None anticipated

11.8 Intrusion Impacts

11.8.1 *Impact on Daily Living and Movement Patterns*

The proposed capital projects and the new Khulu TSF are within the existing mining right boundary. Intrusions on the daily living and movement patterns are thus not anticipated to directly impact on residential areas and/or towns as it will be confined to general mining practices within the mining area, such as the limited movement of workers and equipment to and from the diesel and emulsion batching sites during the operational phase.

The filter cake will be trucked to the new TSF. With regards to the vehicular movement to the different sites investigated for the Khulu TSF, the following should be noted:

- Access to Site B can be obtained from within the mining area and the R577. It is anticipated that the site would be accessed from the existing mining area (probably to the west of the R577) and that the R577 would not be used as main access point. No impacts on the traffic flow to and from Two Rivers Platinum mine, on through-flow traffic and main access to Dwarsrivier Chrome Mine are anticipated. Access to the PCD dam to the west of the R577 however must still be obtained.
- The power lines and servitude to the east of Site B must be also considered in the detailed design.
- There is an existing access road to Site C, thereby providing adequate access and reducing the costs of required road construction and infrastructure. The road, however, might require upgrading. The site is also in relative close proximity to the existing mining activities and limited distances would have to be covered to access the site during the construction and operational phases.
- There is an Eskom servitude within close distance to Site C and a TRP pipeline traverses the site. This can have an impact on the movement and placement of infrastructure on site.
- The existing access road could be used to access Site D and limited additional road infrastructure would be required. The construction of the access road between the South

Shaft/Main Offices and Plant would further ease access to Site D. The site is in close proximity to the existing mining activities and limited distances would have to be covered to access the site.

The impact on the social environment could thus increase for a period of time, but as these activities would be within the existing mining right boundary, the long-term impacts on the daily living and movement patterns are deemed similar to the existing impacts. In this regard, the impacts on the social environment would thus remain constant.

Table 25: Daily Living and Movement Patterns

THEME: DAILY LIVING AND MOVEMENT PATTERNS		
	Without mitigation	**With mitigation / enhancement**
Status	Negative (-)	Negative (-)
Extent	Local (2)	Local (2)
Duration	Medium term (2)	Medium term (2)
Probability	Highly probable (3)	Probable (2)
Intensity	Average (3)	Minor (2)
Significance	Medium (10) -	Medium (8) -
Mitigation: • Access to the Khulu TSF, irrespective of site chosen, and the PCD must consider all safety and security measures and have as little impact on the traffic on the R577 as possible. • The power lines and servitude to the east of Site B and those on Site C must be considered in the detailed design to avoid interruptions in electricity provision. • Access to the mine via the new parking extension should consider all safety and security measures and have as little impact on the traffic on the R577 as possible.		
Expected areas of impact: Mining area, access and haul roads, TSF Site, FTLM area and beyond		
Cumulative impacts: • Other mining activities in the area.		
Residual impacts: None anticipated.		

11.8.2 *Noise related impacts*

The study area is characterised by mining related noise, and vehicular traffic on the public roads. Overall the area could, from a social perspective, still be classified as an area with low ambient noise levels.

Primary sources of noise during mining would include noise emanating from equipment , as well as vehicular traffic and other transport systems (e.g. conveyor systems). Some noise impacts are anticipated outside of the mining rights boundary, but due to the distance of settlements from the mining area, this impact is deemed low.

Noise created by mining activities outside normal working hours would be even more intrusive than those created during daytime due to the low nighttime ambient noise levels.

Table 26: Noise Related Impacts

THEME: NOISE RELATED IMPACTS		
	Without mitigation	**With mitigation / enhancement**
Status	Negative (-)	Negative (-)
Extent	Local (2)	Local (2)
Duration	Medium term (2)	Medium term (2)
Probability	Highly probable (3)	Probable (2)
Intensity	Average (3)	Minor (2)
Significance	Medium (10) -	Medium (8) -
Mitigation: • The mitigation measures of the Noise Impact Assessment are relevant • Operational mining activities with potential noise impacts should be mitigated and should not be undertaken during night time. Noise generating activities should thus be kept to normal working hours (e.g. 7 am until 5 pm) where possible • Heavy machinery and heavy vehicles should be kept in a good working order. Also, ensure that all vehicles and equipment comply with generally accepted noise levels and noise abatement regulations • Personnel should be equipped with the necessary noise protection equipment.		
Expected areas of impact: Mining area.		
Cumulative impacts: • Other mining activities in the area.		
Residual impacts: None		

12. DECOMMISSIONING AND CLOSURE

Decommissioning refers to the actual closure of the mine, the dismantling of the infrastructure (e.g. pipelines, conveyors), the rehabilitation of the TSF and RWD. Decommissioning can also include the replacement of the infrastructure with newer technology.

At this stage, the life of mine is anticipated to be 25 which can be extended by the implementation of the projects. Possible social impacts to be experienced during decommissioning (closure of the mine) could include the following:

- Job losses due to mine closure;
- Decline in the sustainability of the local economy as a result of the loss of employment, household income and capital investments;
- Reduced economic activities within the area with subsequent negative impacts on smaller businesses;
- A decline in the local economy would also have a direct impact on the financial status of the affected local municipalities. This, and the fact that one of the key role players, such as the mine, falls away, would seriously impede the municipality in exercising its functions in terms of strengthening the Local Economic Development (LED) process;
- Negative impact on the revenue base of the local municipalities;

- Population changes and 'outflux' of people from the area;
- Negative impact on the social fabric and social networks;
- A new class of jobseekers targeting other mines in the area;
- Inflow of illegal miners creating social, safety, economic and legal problems and risks;
- Decrease in the quality of life of the surrounding communities due to the discontinuation of social development support and local economic development programmes;
- Possible relocation of families;
- Negative impacts on the local schools;
- Skilled workers moving out of the area in search of employment elsewhere;
- Negative impact on infrastructure development and maintenance;
- A change in community infrastructure;
- A change in the industrial focus of the area;
- Disruptions and nuisance factors associated with the actual decommissioning such as noise, visual and traffic related impacts;
- Increased safety risks associated with the decommissioning of the infrastructure;
- Possible negative impact on the crime levels due to increased unemployment rate;
- Possibility of additional temporary job creation during the decommissioning phase;
- Remnants of possible environmental impacts; and
- Remaining visual impact as a result of mining.

As decommissioning or the replacement of the infrastructure is likely to only take place within approximately 25 years, it is recommended that a detailed Social Impact Assessment be undertaken then to determine the actual impacts on the changing social environment at that stage.

Possible social impacts to be experienced during the replacement of infrastructure with newer technology options would be similar to the impacts described as part of the construction process although more limited.

Table 27: Decommissioning and Closure

THEME: DECOMMISSIONING AND CLOSURE		
	Without mitigation	**With mitigation / enhancement**
Status	Negative (-)	Negative (-)
Extent	Local and regional (3)	Local and regional (3)
Duration	Medium term (2)	Medium term (2)
Probability	Highly probable (3)	Probable (2)
Intensity	Very severe (5)	Severe (4)

Significance	High (13) -	Medium (11) -
Mitigation: • In the event of downscaling and subsequent retrenchments, plans should be developed to put measures in place to assist the affected employees to find alternative forms of employment to limit the negative socio-economic impacts in this regard. • Low risk land-uses to be implemented that would avoid any potential health risks, but that would support livelihood and access to land. • Possible surface and groundwater pollution must be avoided in order to avoid regional negative impacts and impacts on nearby mines that continue to operate. • Rehabilitation according to best practices are imperative to avoid windblown dust, water pollution, land degradation and land instability. • The development of a post closure water management and monitoring strategy must receive priority. • Closure strategies must be developed to ensure collaboration between DCM, the other mines operating in the area and various stakeholders (landowners, municipality, business, community leaders and so forth) in ensuring environmental sustainability and socioeconomic mitigation plans during and post mine closure.		
Expected areas of impact: FTLM area.		
Cumulative impacts: • None at this stage		
Residual impacts: As indicated above		

13. NO-GO ALTERNATIVE

Should the proposed project not proceed, the status quo in terms of the existing social impacts in the area would therefore remain. The Life of Mine would then not be indirectly extended and the mine would cease to operate over a shorter period of time.

The most significant social impact with regards to the no-go alternative relates to the loss in employment opportunities and the overall direct and indirect economic impacts for the region.

As the mine is involved in various corporate social investment programmes these would not be further implemented and no impacts on poverty alleviation would occur as a result of such programmes. The potential loss in terms of employment and economic benefits to the local communities is considered as a critical negative impact.

The 'no-go alternative' should thus not be considered from a social point of view as the negative social impacts anticipated with the expansion project are deemed low. The negative impacts would further respond to mitigation as proposed. The proposed activities further fall within the mining rights area and the area is already characterised by and surrounded by various mining infrastructure.

14. SOCIAL MANAGEMENT PLAN

From a social perspective the mitigation and enhancement measures, as included in the tables above (Sections 10, 11 and 12) must be included as part of the Social Risk Management Plan (SMP) as part of the Environmental Management Plan (EMP).

15. SUMMARY TABLE OF ANTICIPATED IMPACTS

The following table provides a summary of the Impact Risk Class of the impacts anticipated during the construction and operational phases of the proposed project:

Table 28: Summary Table of Anticipated Impacts

Socio-economic Impact	Phase	Significance of Impact	
		Pre-mitigation	**Post-mitigation**
Employment and income opportunities	Construction	Medium (8) +	Medium (9) +
Community Safety and Security	Construction	Medium (9) -	Medium (7) -
Visual impact and sense of place	Construction	Medium (9) -	Medium (7) -
Traffic Movement	Construction	Medium (9) -	Medium (7) -
Air quality impacts	Construction	Medium (8) -	Medium (6) -
Noise	Construction	Medium (8) -	Medium (6) -
Employment and income opportunities	Operations	Medium (10) +	Medium (11) +
Local Procurement	Operations	Medium (10) +	Medium (11) +
Impact on socio-economic development	Operations	Medium (11) +	High (12) +
Capacity Building	Operations	Medium (11) +	High (12) +
Visual impact and sense of place	Operations	Medium (10) -	Medium (9) -
Community safety and security	Operations	Medium (8) -	Medium (8) +
Health Related Risks	Operations	Medium (10) -	Medium (8) -
Daily Living and Movement	Operations	Medium (10) -	Medium (8) -
Noise	Operations	Medium (10) -	Medium (8) -

16. CONCLUDING REMARKS

The proposed project, irrespective of the site selection could have the following potential negative impacts on the adjacent local area:

During the **construction phase** the following **negative impacts** could occur:

- Possible visual impacts on neighbouring landowners/operators, although it is not anticipated that the possible visual impacts would differ significantly from the existing visual impacts created by the mining activities.
- Intrusion impacts (although limited) as a result of the increased traffic flows and movement of workers to and from the construction sites;

- Increase in nuisance factors (e.g. noise, dust/air pollution) especially with regards to the extension of the main parking area due to the proximity to the office complex, with limited off-site intrusions;
- Possible impact on existing infrastructure and servitudes;
- Possible impact on traffic flow on R577 when access crossing between the existing plant and the North Mine will be constructed with subsequent intrusion impacts;
- Safety and security risks due to movement of heavy vehicles and machinery.

During the **operational phase** the following negative impacts could occur:

- Safety and security risks related to general mining activities and the new TSF.
- Nuisance factors (e.g. increase in fallout dust and noise disturbances)
- Negative visual impacts with impacts on the sense of place, although the character of the area would not change as mining is already taking place at different sites within the larger study area.
- Potential negative impact on surface water pollution and groundwater pollution if leachate and seepage are not effectively contained. This could have negative downstream impacts on communities reliant on water from the river or boreholes.
- Health related risks due to possible water pollution, dust pollution, emissions, migrant employees bringing health risks, and nowadays the threat of Covid-19 infection, to mining areas or small towns, as well as the storage of hazardous substances.
- Impact on daily movement patterns at the mine and surrounding area.

During the **decommissioning phase** the following negative impacts could occur:

- Reduced economic activities within the area with subsequent negative trickle-down economic impacts;
- Negative impact on the revenue base of the local municipality;
- Loss of jobs and income of households due to closure; and
- Reduced or no benefits to the local communities experienced through the Mine's SLP.

The **positive impacts** associated with the proposed project include the continuation of employment during the operational phase and some employment creation as part of the various construction activities. This could also have potential positive impacts on the adjacent local area. DCM will further continue with local procurement, capacity building and the overall socio-economic development within the area. Targets for the procurement of capital goods, consumer goods and services should be set and DCM can develop an action plan to meet these targets.

Based on the assessment of the various proposed sites, the following concluding remarks should be noted:

- The location of existing mining infrastructure (whether from DCM or other mines) in close proximity to the sites was considered. The land-use for the sites thus seems compatible with mining development. With regards to the land-use and the presence of existing infrastructure to ensure a goodness of fit, all sites ranked equally.
- Sites B and D are preferred due to the location to the other infrastructure of DCM, the accessibility and the limited impact on the socio-economic environment. The possible intrusion impacts of Site B on the TRPM operations must however be considered.
- From a socio-economic perspective, Site C is not preferred as there are graves present on site which have to be relocated.

From a social perspective it can be concluded that the socio-economic benefits associated with the project outweigh the negative social impacts. The negative impacts can be successfully mitigated if appropriate and successful environmental management, as well as the strict implementation of pro-active mitigation and management measures are applied.

The proposed Dwarsrivier Khulu TSF and capital project can thus be supported. It is recommended that the development of these projects be approved by the relevant authorities.

17. SOURCES CONSULTED

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17.2 Websites

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www.localgovernment.co.za

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www.wazimap.co.za

18. EXPERIENCE RECORD OF THE CONSULTANT

Ms. Ingrid Snyman holds a BA Honours degree in Anthropology. She has more than twenty 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.

CURRICULUM VITAE: INGRID SNYMAN

Name:	**Ingrid Helene Snyman**		
Profession:	Social Development Consultant	**Name of firm:**	Batho Earth
Years of Experience:	20 + years		

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

EXPERIENCE RECORD

2000 to date	Independent Development Consultant: Batho Earth
1996 to 2000	Social Consultant: Afrosearch (Pty) Ltd.

PROJECT EXPERIENCE

Mining Industry

- Beeshoek Optimisation Project, near Postmasburg, Northern Cape (ongoing)
- Gloucester development, near Postmasburg, Northern Cape (ongoing)
- Blesboklaagte Colliery Section 102, Mpumalanga
- Kareerand Tailings Storage Facility (TSF) Expansion Project, Near Stilfontein, North West Province
- Khumani Mine, Mokaning Expansion, Kathu, Northern Cape Province (ongoing)
- Theta Hill Gold Mining Project near Pilgrim's Rest, Mpumalanga
- Khulu TSF at Dwarsrivier Mine, near Steelpoort, Limpopo Province (ongoing)
- Social Risk Assessment for Dwarsrivier Chrome Mine, near Steelpoort, Limpopo Province
- Vandyksdrift Central (VDDC) Mining: Infrastructure Development, Mpumalanga
- Various additional listed activities at the Dwarsrivier Chrome Mine, near Steelpoort, Limpopo Province
- Project 10161 and Project 10167 (Gold Mining) by Stonewall (Pty) Ltd., near Sabie and Pilgrims Rest, Mpumalanga
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- Wildealskloof Mixed Use Development near Bloemfontein, Free State (ongoing)
- 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
- Mixed Land Use Development situated on the Remainder of Allandale 10 IR, known as Rabie Ridge Ext 7, Midrand, Gauteng
- Basic Assessment for the proposed development of Project One (1) of the Vosloorus Extension 9 High Density Housing Project, Ekurhuleni Metropolitan Municipality
- Mapochsgronde Residential Development, Roossenekal, Limpop Province
- Cullinan Estate Development, Cullinan, Gauteng
- Vlakfontein Residential Development and investigation with regards to the possible resettlement of individual households, Brakpan, Gauteng
- Township development/eco-estate on the farm Grants Valley, Eastern Cape

Bulk Infrastructure and Supply

- Integrated Public Transport Network for the Mangaung Metropolitan Municipality (ongoing)
- Olifantsfontein Landfill, Gauteng (ongoing)
- K43 Road Construction near Lenasia, Gauteng
- Mangaung Bus Depot for the Integrated Public Transport Network (IPTN) in Bloemfontein, Free State
- Greenwich Landfill Site, Newcastle, KwaZulu Natal
- Mangaung Gariep Water Augmentation Project, Free State
- Tshwane Regional General Waste Disposal Facility (Multisand Landfill), Pretoria, Gauteng Province
- 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
- Extension of the Wemmershoek Wastewater Treatment Works (WWTW), decommissioning of the Franschhoek WWTW and construction of a transfer and outfall sewer between the two works, Franschhoek, Western Cape
- Lefaragathle, Mogono, Rasimone, Chaneng outfall sewer and Chaneng sewer treatment plant, Rustenburg (Phokeng), North West Province
- Upgrading of railway stations and railway line for Metrorail in Mamelodi, Gauteng
- ACSA Remote Aprons Project, O.R. Tambo International Airport, Gauteng
- 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

- Crowthorne-Lulamisa power line, Midrand, Gauteng
- Basic Assessment for the proposed Crowthorne Underground Cable, Gauteng
- Basic Assessment for the proposed Diepsloot East Servitude and substation, Gauteng
- Mitchells Plain-Firgrove-Stikland Transmission Line project and investigation with regards to the possible resettlement of individuals within Mitchells Plain, Western Cape
- 400 kV Transmission Power Line for approximately 10km to the west of the existing Marathon Substation and possible resettlement of homesteads, Nelspruit area, Mpumalanga
- 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
- Basic Assessment for the proposed construction of the Eskom Rhombus-Lethabong 88kv Powerline and Substation, North West Province

- Aberdeen-Droerivier 400 kV Transmission Power Line, Eastern and Western Cape Province
- Houhoek Substation Upgrade and Bacchus-Palmiet Loop-In and Loop-Out, near Botrivier, Western Cape Province
- Arnot-Gumeni 400 kV Transmission Power Line, Mpumalanga
- Aggeneis-Oranjemond Transmission Line project, Northern Cape Province
- Ariadne-Venus Transmission Line, KwaZulu Natal
- Dominion Reefs Power Line project, North West Province
- Kyalami Strengthening Project, Kyalami, Gauteng
- 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
- Poseidon-Grassridge No. 3 400 kV Transmission line and the extension of the Grassridge Substation, Eastern Cape Province
- Construction of power lines between the Grassridge Substation (near Port Elizabeth) and the Coega Industrial Development Zone, Eastern Cape Province
- Matimba-Witkop No. 2 400 kV Transmission line in the Limpopo Province

Photovoltaic and Wind Energy Facilities

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

Public Participation

- Beeshoek Optimisation Project, Northern Cape Province
- Mixed Land Use Development Referred to as Mogale Ext 42, 43 And 44, Muldersdrift, Mogale, Gauteng Province
- Khumani Mokaneng Extension, Northern Cape Province
- Theta Project, Mpumalanga
- Dwarsrivier Chrome Mine (Pty) Ltd.: Environmental Authorisation Application for various Listed Activities at the Dwarsrivier Chrome Mine, Near Steelpoort, Limpopo Province (ongoing)
- Proposed Project 10161 and Project 10167 (Gold Mining) by Stonewall (Pty) Ltd., near Sabie and Pilgrims Rest, Mpumalanga
- Piggery near Modimolle, Limpopo Province
- Truck Stop Development, Buffelspoort, North West Province
- Upgrading of the Menlyn Road Network and the investigation, as well as negotiations with regards to the resettlement of households, Pretoria, Gauteng
- 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
- Brewery and associated industrial activities for Heineken Supply Co (Pty) Ltd, Kempton Park, Gauteng.

19. 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 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