



mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

DRAFT FOR COMMENTING

SCOPING REPORT

FOR LISTED ACTIVITIES ASSOCIATED WITH MINING RIGHT AND/OR BULK SAMPLING ACTIVITIES INCLUDING TRENCHING IN CASES OF ALLUVIAL DIAMOND PROSPECTING.

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

Name of Applicant	Mphahlele Community Development Trust
Project	Mphahlele Mine
Tel No	0765485719
Fax No	086 750 3175
Postal Address	597 Alaska Street, Faerie Glen, Pretoria, 0081
Physical Address	597 Alaska Street, Faerie Glen, Pretoria, 0081
File Reference Numbers SAMRAD	LP 30/1/2/3/2/1(10184) EM

September 2020

IMPORTANT NOTICE

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

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

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

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

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



OBJECTIVE OF THE SCOPING PROCESS

- 1) The objective of the scoping process is to, through a consultative process
 - a) Identify the relevant policies and legislation relevant to the activity;
 - b) Motivate the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;
 - c) Identify and confirm the preferred activity and technology alternative through an impact and risk assessment and ranking process;
 - d) identify and confirm the preferred site, through a detailed site selection process, which includes an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified alternatives focusing on the geographical, physical, biological, social, economic, and cultural aspects of the environment;
 - e) Identify the key issues to be addressed in the assessment phase;
 - f) agree on the level of assessment to be undertaken, including the methodology to be applied, the expertise required as well as the extent of further consultation to be undertaken to determine the impacts and risks the activity will impose on the preferred site through the life of the activity, including the nature, significance, consequence, extent, duration and probability of the impacts to inform the location of the development footprint within the preferred site; and
 - g) Identify suitable measures to avoid, manage, or mitigate identified impacts and to determine the extent of the residual risks that need to be managed and monitored.



Table of Contents

1	CONTACT PERSON AND CORRESPONDENCE ADDRESS	8
1.1	Details of EAP who prepared the report.....	8
1.2	Expertise of the EAP	8
1.2.1	Qualifications of EAP (set out in Appendix 1)	8
1.2.2	Summary of EAP’s past experience (set out in Appendix 1 and 2)	8
2	DESCRIPTION OF PROPERTY	10
2.1	Locality map	10
3	DESCRIPTION OF THE SCOPE OF THE PROPOSED OVERALL ACTIVITY.....	11
3.1	Listed and Specified activities	11
3.2	Description of the activities to be undertaken	15
3.3	Mining Method	16
3.3.1	Opencast	16
3.3.2	Underground.....	18
3.4	Mine Infrastructure.....	19
3.4.1	Water supply.....	19
3.4.2	Power supply.....	19
3.4.3	Wash plant	20
3.4.4	Waste management.....	22
4	POLICY AND LEGISLATIVE CONTEXT	24
5	NEED AND DESIRABILITY OF THE PROPOSED ACTIVITIES	39
6	PERIOD FOR WHICH THE ENVIRONMENTAL AUTHORISATION IS REQUIRED.....	41
7	DESCRIPTION OF THE PROCESS FOLLOWED TO REACH THE PROPOSED PREFERRED SITE	41
7.1	Site Alternatives.....	41
7.2	Design and Layout Alternatives.....	42
7.2.1	Waste Stockpiles and Opencast.....	42
7.2.2	Storm water Management and PCD’s Layout.....	43
7.2.3	Site Alternatives and requirements for a Tailings Dam	43
7.3	Activity Alternatives.....	43
7.4	Process Alternatives.....	43
7.5	No Go Option	44
8	DETAILS OF THE PUBLIC PARTICIPATION PROCESS FOLLOWED	45
8.1	Newspaper Advertisements	45
8.2	Site Notices	45
8.3	Written Notifications	45
8.4	Notification of I&APs of Reports Availability	46
8.5	Registration and Draft Scoping Report	46
9	ENVIRONMENTAL ATTRIBUTES ASSOCIATED WITH THE SITES	47
9.1	Baseline Environment	47
9.2	Regional Location.....	47
9.3	Climate.....	47
9.4	Topography.....	48
9.5	Geology.....	48
9.6	Soil and land capability	49
9.7	Surface Water	49
9.8	Wetlands.....	51
9.9	Groundwater	51
9.10	Terrestrial Ecology	52
9.10.1	Flora	52



9.10.2	Fauna	53
9.11	Air Quality.....	55
9.12	Noise.....	56
9.13	Archaeology and Heritage.....	56
9.14	Socio Economic Conditions.....	56
9.15	Description of the Current Land Uses	58
9.15.1	Sensitive landscapes	59
10	IMPACTS AND RISKS IDENTIFIED INCLUDING THE NATURE, SIGNIFICANCE, CONSEQUENCE, EXTENT, DURATION AND PROBABILITY OF THE IMPACTS, INCLUDING THE DEGREE TO WHICH THESE IMPACTS CAN BE MANAGED.....	61
10.1	Impacts Identified	61
10.3	Specialist Investigations	66
11	METHODOLOGY USED IN DETERMINING THE SIGNIFICANCE OF ENVIRONMENTAL IMPACTS	67
11.1	Assessment Criteria.....	67
11.2	Mitigation	68
11.2.1	Determination of Significance-Without Mitigation	68
11.2.2	Determination of Significance- With Mitigation	68
11.3	Assessment Weighting	69
11.3.1	Ranking, Weighting and Scaling	69
11.3.2	Identifying the Potential Impacts Without Mitigation Measures (WOM)	70
11.3.3	Identifying the Potential Impacts With Mitigation Measures (WM)	70
11.3.4	Mitigation Efficiency (ME).....	70
11.3.5	Significance Following Mitigation (SFM).....	70
12	THE POSITIVE AND NEGATIVE IMPACTS IN TERMS OF THE SITE LAYOUT THAT THE PROPOSED ACTIVITY AND ALTERNATIVES WILL HAVE ON THE ENVIRONMENT AND THE COMMUNITY THAT MAY BE AFFECTED	71
13	THE POSSIBLE MITIGATION MEASURES THAT COULD BE APPLIED AND THE LEVEL OF RISK.....	72
14	THE OUTCOME OF THE SITE SELECTION MATRIX, FINAL SITE LAYOUT PLAN.....	82
15	MOTIVATION WHERE NO ALTERNATIVE SITES WERE CONSIDERED	82
16	STATEMENT MOTIVATING THE PREFERRED SITE	82
17	PLAN OF STUDY FOR THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS	83
17.1	Description of alternatives to be considered including the option of not going ahead with the activity	83
17.2	Description of the aspects to be assessed as part of the environmental impact assessment process	83
17.3	Description of Aspects to be assessed by Specialists.....	84
17.3.1	Description of the Affected Environment.....	85
17.3.2	Legal requirements	85
17.3.3	Impact Identification and Assessment.....	85
17.3.4	Mitigation Measures.....	85
17.3.5	Recommended Monitoring and Evaluation Program	86
17.4	Proposed Method of Assessing the Environmental Aspects Including the Proposed Method of Assessing Alternatives.....	86
17.5	Proposed method of assessing duration and significance	86
17.6	The Stages at which the Competent Authority will be consulted	86
17.7	Particulars of the public participation process with regard to the Impact Assessment process that will be conducted	86
17.7.1	Report Comment Periods	87
17.7.2	Public Meetings and Open Days	87



17.7.3	Description of the information to be provided to Interested and Affected Parties	87
17.8	Description of the tasks that will be undertaken during the environmental impact assessment process	88
18	MEASURES TO AVOID, REVERSE, MITIGATE, OR MANAGE IDENTIFIED IMPACTS AND TO DETERMINE THE EXTENT OF THE RESIDUAL RISKS THAT NEED TO BE MANAGED AND MONITORED.....	89
19	OTHER INFORMATION REQUIRED BY THE COMPETENT AUTHORITY	95
19.1	Impact on the socio-economic conditions of any directly affected person	95
19.2	Impact on any National Estate referred to in Section 3(2) of the National Heritage Act	95
19.3	Other Matters required in terms of Section 24(4)(a) and (b) of the Act.....	95
20	UNDERTAKING REGARDING CORRECTNESS OF INFORMATION	96
21	UNDERTAKING REGARDING LEVEL OF INFORMATION.....	96

List of Figures

	Page
Figure 1: Mining Right area locality	10
Figure 2: Preliminary layout of the proposed Mphahlele Mine.....	16
Figure 3: Roll-over Mining Method	17
Figure 4: Near vertical stoping steep dip mining method.....	18
Figure 5: Flow diagram of the proposed plant	22
Figure 6: Catchment.....	50
Figure 7: Rivers in the vicinity of the project site	50
Figure 8: Vegetation Type occurring on the project area.....	52
Figure 9: Traditional Authorities in the Local Municipality.....	57
Figure 10: Land use in the Lepelle-Nkumpi LM.....	58
Figure 11: LCP Biodiversity areas occurring on the project site	60

List of Tables

	Page
Table 1: Details of EAP	8
Table 2: Proposed activities for Mphahlele Mine.....	11
Table 3: Competent Authorities.....	24
Table 4: Applicable Legislation relevant to the Proposed Project.....	24
Table 5: Mine Infrastructure Arrangement Selection	42
Table 9: Average monthly precipitation (WR2012).....	47
Table 10: Average monthly evaporation.....	48
Table 11: Plant species of conservation concern which may occur within the proposed project area.....	53
Table 12: Provincially protected plants which may occur on the proposed project area	53
Table 13: Mammal species which are highly likely to occur in the proposed project area.....	54
Table 14: Avifaunal SCC that may occur on the project site	54
Table 15: Reptile species which may occur in the proposed project area.....	54
Table 16: Amphibian species which may occur in the proposed project area	55
Table 17: Sensitive Landscapes within the Proposed Mining Site	59
Table 18: Anticipated Impacts associated with the Proposed Project	62
Table 37: Impact Assessment Criteria	67
Table 38: Significance-Without Mitigation	68
Table 39: Significance- With Mitigation	69
Table 40: Description of assessment parameters with its respective weighting.....	69
Table 22: Proposed Mitigation Measures	72
Table 23: List of Specialists and Specialist Studies	84



Appendices

Appendix 1	Qualifications of EAP
Appendix 2	EAP's Experience
Appendix 3	Locality map
Appendix 4	Site layout map
Appendix 5	Public Participation Information
Appendix 6	Environmental Screening Report
Appendix 7	NEMA and Mining Right Application acceptance



1 CONTACT PERSON AND CORRESPONDENCE ADDRESS

1.1 Details of EAP who prepared the report

Name of the Practitioner:	Nicole Upton
Tel No.:	079 555 2433
Fax No.:	N/A
Postal address:	PostNet Suite 0111, Private Bag X37, Lynnwood Ridge
E-mail address:	nicole@redkiteconsulting.co.za

1.2 Expertise of the EAP

1.2.1 Qualifications of EAP (set out in Appendix 1)

Please refer to Table 1 for a summary of the qualification and experience of the EAP. Refer to Appendix 1 and 2 for more details (CV).

1.2.2 Summary of EAP's past experience (set out in Appendix 1 and 2)

Please refer to Table 1 for a summary of the qualification and experience of the EAP. Refer to Appendix 2 for more details (experience).

Table 1: Details of EAP

Name	Nicole
Surname	Upton
Company	Red Kite Environmental Solutions (Pty) Ltd
Position	Director – Environmental Assessment Practitioner (EAP)
Location	2055 Cura Avenue, Equestria, Pretoria
Email	nicole@redkiteconsulting.co.za
Telephone Number	079 555 24334
Education	BSc Honors Animal, Plant and Environmental Sciences
Professional affiliation(s):	<ul style="list-style-type: none"> • South African Council for Natural Scientific Professions (SACNASP) <ul style="list-style-type: none"> ○ (Registration Number: 121030) • Water Institute of Southern Africa (WISA) <ul style="list-style-type: none"> ○ (Membership No: 39243) • International Association for Impact Assessments (IAIASa) <ul style="list-style-type: none"> ○ (No. 6185)
Professional summary	Ms. Upton has a qualification in B.Sc. (Hons) Animal, Plants and Environmental Science (Appendix 1) and has 9 years of applicable experience as a project manager on a number of Environmental Impact Assessments (EIAs) and environmental authorisations for predominately industrial and mining clients in the South African market. Nicole has extensive integrated environmental management experience, including, EIAs, implementation of environmental management programmes, environmental monitoring, compliance auditing and monitoring, project management and general environmental support. Refer to Appendix 2 for further details.
Skills	<ul style="list-style-type: none"> • Mine Closure financial quantum determination, mine rehabilitation. • Management and coordination of environmental compliance aspects for opencast and



	<p>underground mining.</p> <ul style="list-style-type: none">• Alien Invasive Plant monitoring, control and reporting.• Water quality monitoring, measurement, reporting and data analyses including surface water, ground water, process water, sewage water and biological indicators.• Legal compliance auditing and reporting in accordance with the National Environmental Management Acts and other associated environmental related legislation (NEMA listed activities, Water Use Licensing, Waste Licensing, etc.)• Environmental impact assessments and Integrated Water Use License Applications, including rehabilitations plans and IWWMPs.• Environmental Control Officer Site inspections and associated reporting and compliance.• Specialist impact assessments for surface water and ecology.• Conceptual and operational water balances and Water Conservation and Demand Management Plans
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2 DESCRIPTION OF PROPERTY

Farm Names:	Locatie van M'phatlele 457 - KS
Application area (Ha):	11725.0951
Magisterial district:	Lepelle-Nkumpi Magisterial District
Distance and direction from nearest town:	60 km south-east of Mokopane and 50 km south of Polokwane
21-digit Surveyor General Code for each farm portion:	TOKS00000000045700000

2.1 Locality map

Please refer to Appendix 3 for the Locality Maps for the project area.

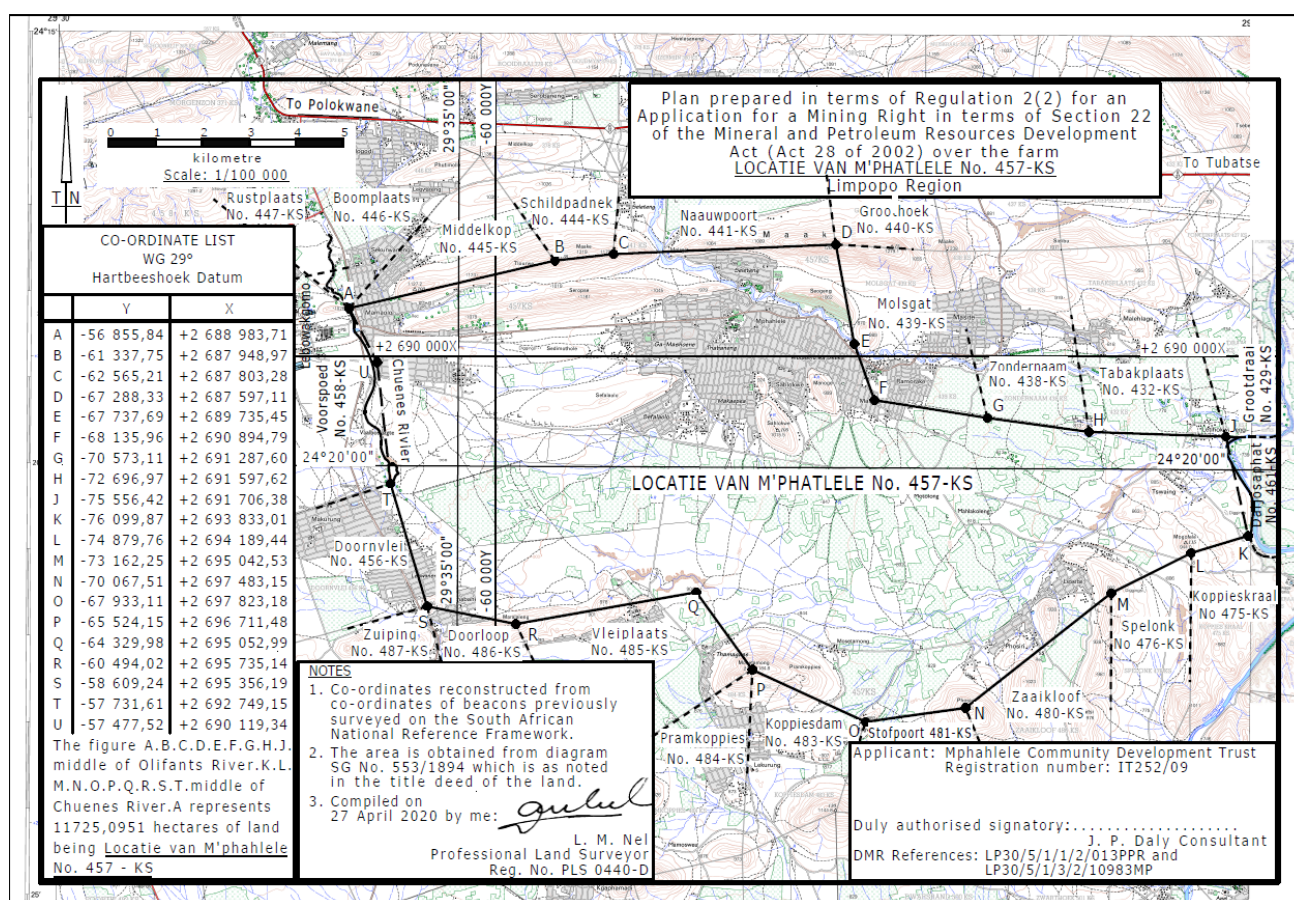


Figure 1: Mining Right area locality



3 DESCRIPTION OF THE SCOPE OF THE PROPOSED OVERALL ACTIVITY

Provide a plan drawn to scale acceptable to the competent authority but not less than 1:10 000 that shows the location, and area (ha) of all aforesaid main and listed activities, and infrastructure to be placed onsite and attached as Appendix 4.

3.1 Listed and Specified activities

Table 2: Proposed activities for Mphahlele Mine

NAME OF ACTIVITY (E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc. E.g. for mining, - excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc.)	Aerial extent of the Activity Ha or m²	LISTED ACTIVITY (Mark with an X where applicable or affected).	APPLICABLE LISTING NOTICE (GNR 324, 325, 327)	WASTE MANAGEMENT AUTHORISATION (Indicate whether an authorisation is required in terms of the Waste Management Act). (Mark with an X)
GN325(17) Any activity including the operation of that activity which requires a mining right as contemplated in section 22 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002). Opencast mining	2345 ha (to be confirmed)	X	GN325(17)	-
GN325(17) Any activity including the operation of that activity which requires a mining right as contemplated in section 22 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002). Underground mining	775 ha (to be confirmed)	X	GN325(17)	-
Blasting	-	-	Not listed	-
GN921 Category B (11) The establishment or reclamation of a residue stockpile or residue deposit resulting from activities which require a mining right, exploration right or production right in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002). Temporary waste rock stockpiling	25 ha (to be confirmed)	-	GN921 Category B (11)	X
GN325(6) The development of facilities or infrastructure for any process or activity which requires a permit or licence or an amended permit or licence in terms of national or provincial legislation governing the generation or release of emissions,	15 ha (to be confirmed)	X	GN325(6)	-



NAME OF ACTIVITY (E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc. E.g. for mining, - excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc.)	Aerial extent of the Activity Ha or m²	LISTED ACTIVITY (Mark with an X where applicable or affected).	APPLICABLE LISTING NOTICE (GNR 324, 325, 327)	WASTE MANAGEMENT AUTHORISATION (Indicate whether an authorisation is required in terms of the Waste Management Act). (Mark with an X)
pollution or effluent ROM stockpiling				
Temporary topsoil storage/and removal	4 ha (to be confirmed)	-	Not listed	-
GN921 Category B (11) The establishment or reclamation of a residue stockpile or residue deposit resulting from activities which require a mining right, exploration right or production right in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002). Temporary overburden stockpiles	25 ha (to be confirmed)	-	GN921 Category B (11)	X
Hauling and transporting	-	-	Not listed	-
GN325(27) The development of a road – Road construction	12 ha (to be confirmed)	X	GN325(27)	-
Placement of fences	23 km (to be confirmed)	-	Not listed	-
GN325(6) The development of facilities or infrastructure for any process or activity which requires a permit or licence or an amended permit or licence in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent Dust suppression	10 ha (to be confirmed)	X	GN325(6)	-
GN325(15) The clearance of an area of 20 hectares or more of indigenous vegetation Removal of indigenous vegetation	2400 ha (to be confirmed)	X	GN325(15)	-
Product stockpiling	1 ha (To be confirmed)	-	Not listed	-
GN921 Category B (11) The establishment or reclamation of a residue stockpile or residue	2345 ha	X	GN921 Category B	X



NAME OF ACTIVITY (E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc. E.g. for mining, - excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc.)	Aerial extent of the Activity Ha or m²	LISTED ACTIVITY (Mark with an X where applicable or affected).	APPLICABLE LISTING NOTICE (GNR 324, 325, 327)	WASTE MANAGEMENT AUTHORISATION (Indicate whether an authorisation is required in terms of the Waste Management Act). (Mark with an X)
deposit resulting from activities which require a mining right, exploration right or production right in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002). GN325(6) The development of facilities or infrastructure for any process or activity which requires a permit or licence or an amended permit or licence in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent Backfilling of opencast areas with tailings, overburden and waste rock material			(11) GN325(6)	
GN325(17) Any activity including the operation of that activity which requires a mining right as contemplated in section 22 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002). Wash plant	3 ha (to be confirmed)	X	GN325(17)	-
GN325(17) Any activity including the operation of that activity which requires a mining right as contemplated in section 22 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002). Crushing and screening	3 ha (to be confirmed)	X	GN325(17)	-
GN921 Category B (11) The establishment or reclamation of a residue stockpile or residue deposit resulting from activities which require a mining right, exploration right or production right in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002). GN325(6) The development of facilities or infrastructure for any process or activity	2 ha (to be confirmed)	X	GN921 Category B (11) GN325(6)	X



NAME OF ACTIVITY (E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc. E.g. for mining, - excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc.)	Aerial extent of the Activity Ha or m²	LISTED ACTIVITY (Mark with an X where applicable or affected).	APPLICABLE LISTING NOTICE (GNR 324, 325, 327)	WASTE MANAGEMENT AUTHORISATION (Indicate whether an authorisation is required in terms of the Waste Management Act). (Mark with an X)
which requires a permit or licence or an amended permit or licence in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent Tailings drying facility				
GN921 Category B (11) The establishment or reclamation of a residue stockpile or residue deposit resulting from activities which require a mining right, exploration right or production right in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002). GN325(6) The development of facilities or infrastructure for any process or activity which requires a permit or licence or an amended permit or licence in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent Tailings stockpile	5 ha (to be confirmed)	X	GN921 Category B (11) GN325(6)	X
Workshop, administrative buildings and parking areas	1 ha (to be confirmed)	-	Not listed	-
Groundwater abstraction (boreholes)	-	-	Not listed	-
Storm water management infrastructure (channels, berms and pollution control dams)	3 ha (to be confirmed)	-	Not listed	-
Process and clean water storage	Included in applicable infrastructure areas	-	Not listed	-
Ablution facilities	Included in office areas	-	Not listed	-
Dewatering of opencast and underground mining areas	2345 ha (to be confirmed)	-	Not listed	-
GN327(12) The development of—	Extent of mining	X	GN327(12)	-



NAME OF ACTIVITY (E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc. E.g. for mining, - excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc.)	Aerial extent of the Activity Ha or m²	LISTED ACTIVITY (Mark with an X where applicable or affected).	APPLICABLE LISTING NOTICE (GNR 324, 325, 327)	WASTE MANAGEMENT AUTHORISATION (Indicate whether an authorisation is required in terms of the Waste Management Act). (Mark with an X)
(ii) infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs— (a) within a watercourse; (b) in front of a development setback; or (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse; Construction of mining related infrastructure, channels, pollution control dams and opencast mining within 32 m of various watercourses	operation			

3.2 Description of the activities to be undertaken

The Mphahlele Community Development Trust holds a Mining Permit (LP30/5/1/3/2/10983MP) and Prospecting Right (LP30/5/1/1/2/013PPR) over the farm Locatie van M'phatlele 457 KS for their current small-scale opencast operations. The Mining Right area is situated 60 km south-east of Mokopane and 50 km south of Polokwane in the Limpopo Province.

Current mining operations consist of opencast mining (small-scale), overburden and ROM stockpiling and associated activities. Mining is currently restricted to the 5 ha mining permit issued for the operation. Thus, the applicant proposes to apply for a Mining Right on the same farm portion to extend the existing opencast operations and to establish underground mining. The mine also proposes to establish a wash plant and associated facilities such as residue stockpiles. The residue material from the wash plant will be allowed to dry, where after it will be stockpiled and used as backfill material for the opencast void, thus no tailings dam will be constructed for the project.

The mining project will include the following infrastructure and activities:

- Opencast and underground mining of chrome
- Backfilling of opencast void with waste rock/overburden and tailings
- Haul and access roads (including drainage line crossings)
- Workshop, administrative buildings and parking areas
- Processing plant (including crushing and screening)
- Stockpiles (topsoil, ROM, waste rock/overburden, product)
- Groundwater abstraction (boreholes)
- Storm water management infrastructure (channels, berms and pollution control dams)
- Tailings storage facilities – a tailings drying pad and dry stockpiling
- Ablution facilities
- Process and clean water storage



The open cast pit will be mined in a typical grid by grid truck and shovel method. Initially there will be topsoil stripping and stockpiling, then subsequent drilling and blasting of rock (interburden etc.) rock face thereafter. Handling of Run of Mine (ROM) with large front-end loaders and trucks will complete the open cast mining. Waste rock will be stockpiled until such time as there is sufficient space available inside the pit for storage of waste. Then waste rock will be placed in mined out areas as the face is advanced.

The method for tailings storage will be a wet tailings pad (likely concrete) and dry tailings stockpile with backfilling of the opencast void with tailings material. Wet tailings from the wash plant will be allowed to dry on cement drying slabs. This is done to facilitate the maximum recovery of water to be reused at the plant. Once tailings have dried sufficiently, they will be transferred to the dry tailings stockpile.

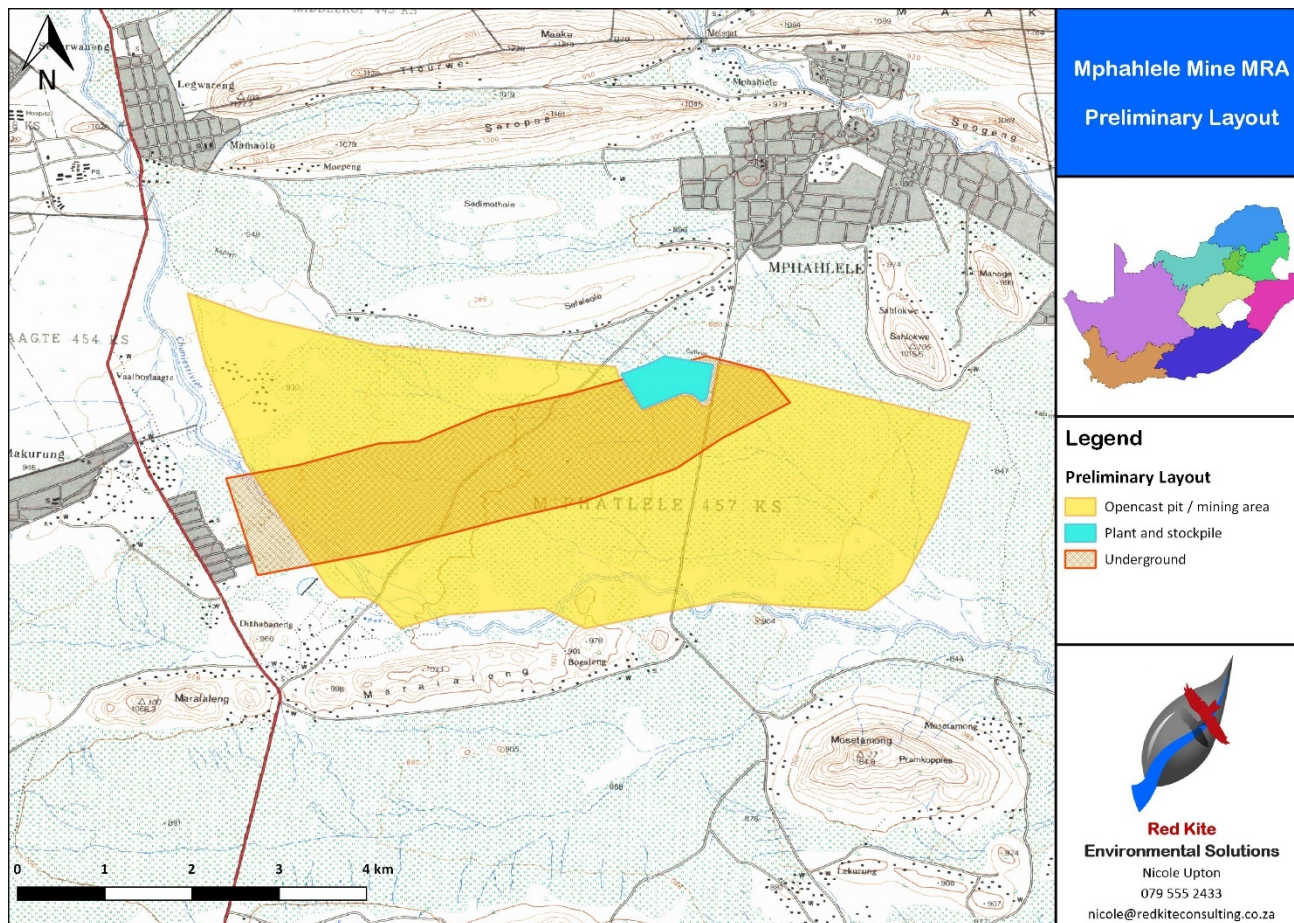


Figure 2: Preliminary layout of the proposed Mphahlele Mine

3.3 Mining Method

3.3.1 Opencast

Resources situated close to surface will be mined via open pit type mining. The mine will be established by opencast strip mining, being roll over truck and shovel operations that will culminate in an established high wall access for the underground. Initially there will be topsoil stripping and stockpiling, then subsequent drilling and blasting of rock (interburden etc.) rock face thereafter. Handling of Run of Mine (ROM) with large front-end loaders and trucks will complete the opencast mining. Waste rock and overburden will be stockpiled until such time as there is sufficient space available inside the pit for storage of waste. Then the waste rock will be placed in mined out areas as the face is advanced.



The production methods to be used are typical of open pit operations and consist of the following steps:

- Strip the 70 cm of top soil and stockpile for future rehabilitation work
- Strip overburden until solid rock is encountered and stockpile this for future rehabilitation
- Drill and blast the solid overburden, remove for stockpiling and at a later stage, perform back filling of the pits
- On encountering the ore seams reduce bench height and drill and blast the ore
- Load the ore into trucks using hydraulic shovels or front-end loaders
- Transport the ore to the processing plant ROM for stockpiling
- Drill and blast the internal solid overburden and remove for stockpiling

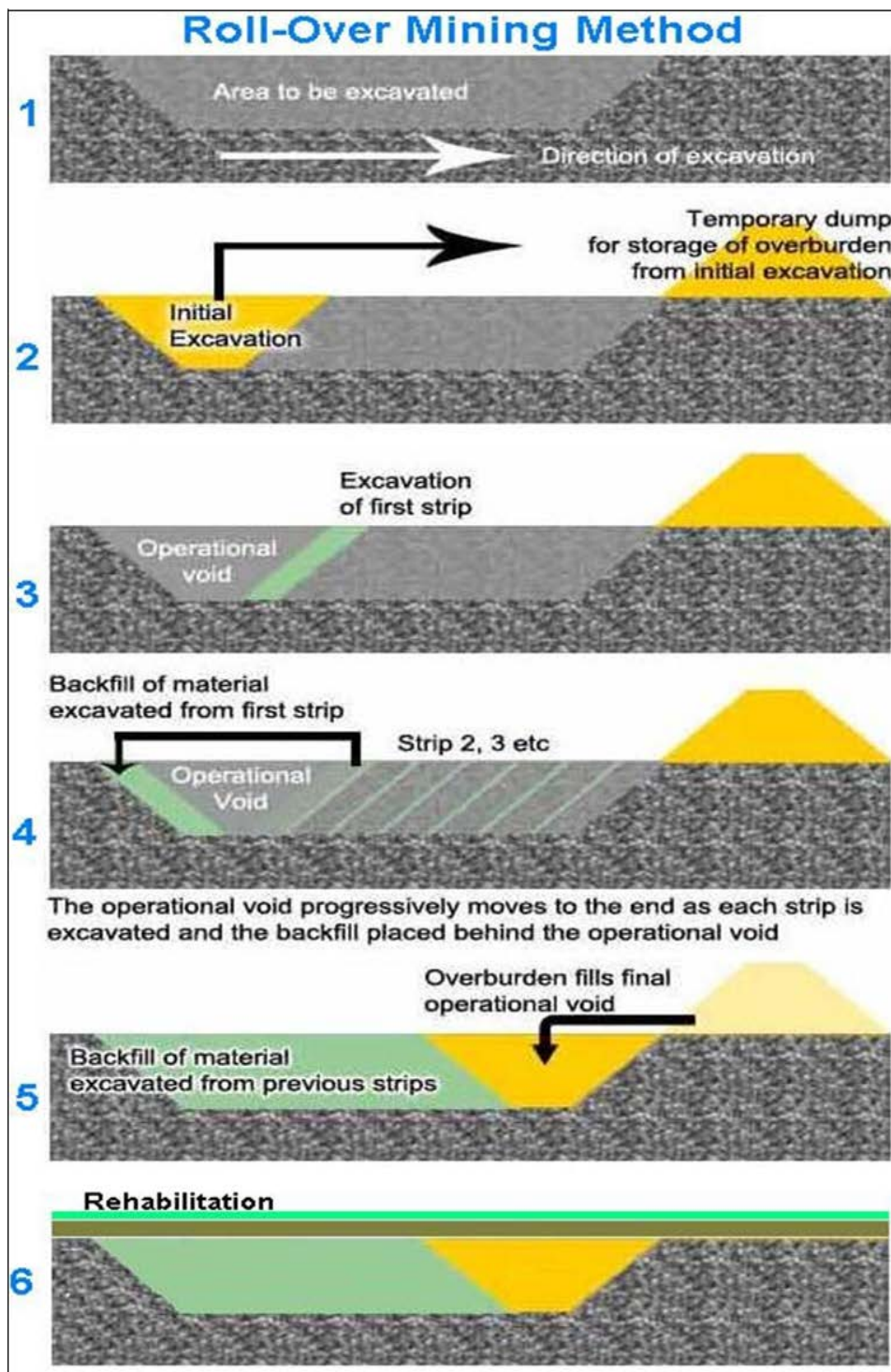


Figure 3: Roll-over Mining Method



3.3.2 Underground

The pit will be used to develop portals, which will allow the remainder of the ore to be exploited using underground mining methods.

Because the targeted chrome seams are steeply dipping, the mining method to be deployed would be block caving or near vertical stoping steep dip mining as the most suitable mining method for the mining resource under consideration and mechanical equipment will be utilised:

- Development rates are faster compared to conventional systems.
- It offers greater flexibility in terms of dealing with geological and quality anomalies compared to other mining methods.
- Safety is enhanced as few people are involved and most of the work is done by machinery.
- Personnel, equipment, and consumables can be moved efficiently and almost directly to the working faces.
- Shift change-over times are reduced with concomitant improvements in productivity.
- Supervision is also improved as all working places can be visited with less effort compared to conventional methods.

Mining extraction is achieved by developing a series of roadways on the seam on strike and connecting them by holdings or cut throughs to form pillars that provide support for the overlying strata. Mining extraction in this method is a function of the pillar sizes which in turn is a function of the depth from surface as well as the Chrome seams being targeted.

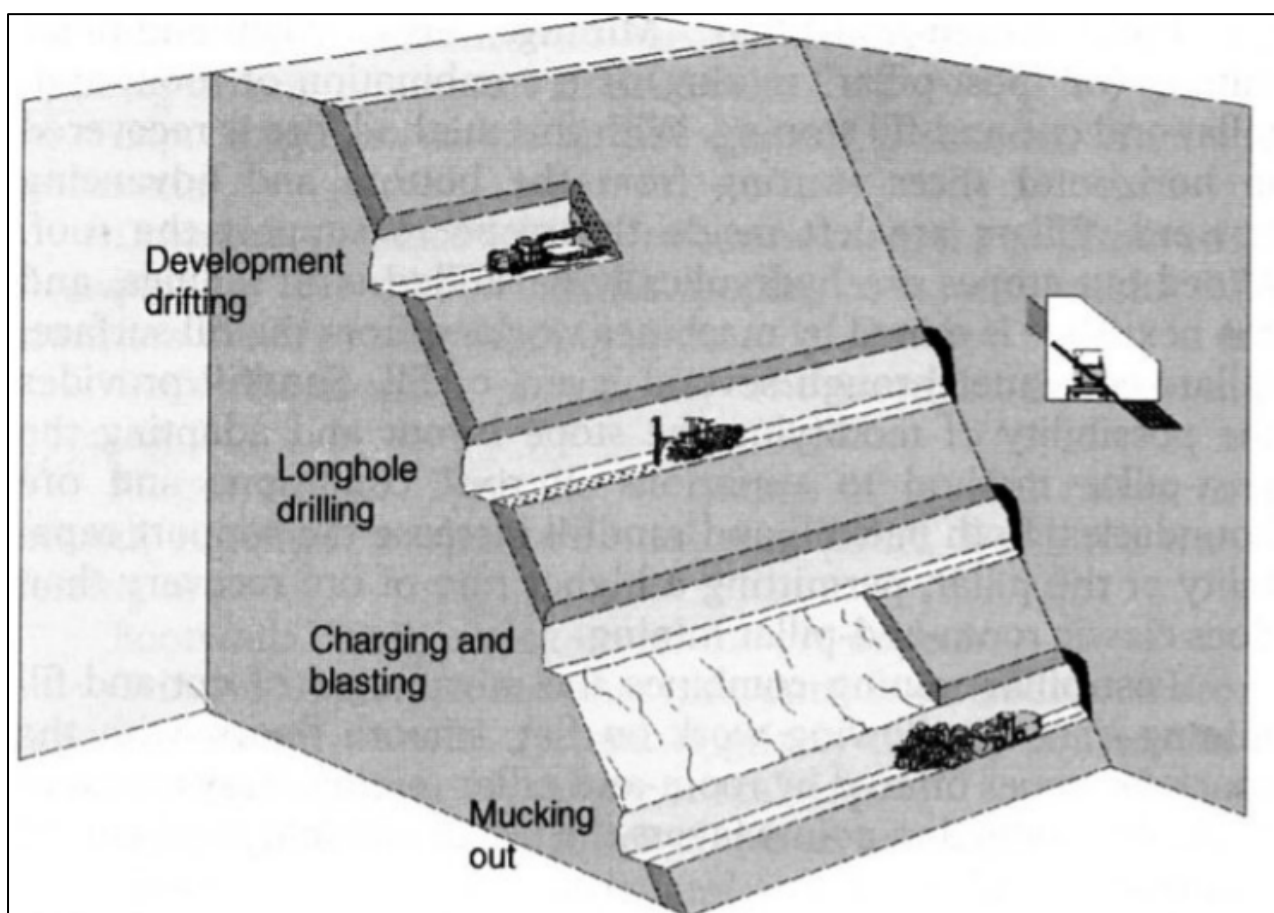


Figure 4: Near vertical stoping steep dip mining method

The methods used may vary throughout each mine, depending on the changing characteristics of the ore body and mine planning techniques. It is common to dig shafts vertically downwards to reach the ore body, however, in the case of Mphahlele, it is planned to establish steep inclines to reach the ore body at depths of 100 m and going down to 450 m. From these levels, horizontal drive levels will be developed on reef. Stopping then takes place from these levels.

3.4 Mine Infrastructure

- Roads: Access and haul roads will be constructed to service the mining operations.
- Waste Rock Dump: A waste rock dump will need to be established. Waste rock will be backfilled into the opencast void as part off the roll-over mining method.
- Pollution Control Dams: Storm water infrastructure will need to be designed and constructed for the proposed mining operation. A pollution control dam/s (PCD) will be required for the storage of contaminated water originating from the mining activities. Water contained within the PCD will be utilised for dust suppression and when possible for the wash plant processes. The PCD will be designed by an engineer as part of the Storm Water Management Plan.
- Clean and Dirty Water Systems: Storm water infrastructure will need to be constructed for the proposed mining operations. Clean and dirty water systems will need to be constructed in order to ensure clean and contaminated water is kept separated within the mine areas. A Storm Water Management Plan will be drafted as part of this application and included in the EIA Report.
- Boreholes: Boreholes will be required to be sunk at strategic locations within the mining area. The purpose of the boreholes includes the monitoring of groundwater quality and the abstraction of groundwater.
- Offices, Storage areas, Ablution Facilities and Parking
- Diesel bays and refuelling areas
- Material loading areas
- Workshop
- Wastewater Treatment Plant: Sewage water will be treated for reuse in the onsite processes.
- Return Water Dams: Return water dam systems will be installed at the wash plant and underground operations to facilitate the storage and recycling of process water
- Topsoil stockpile: Topsoil will be stripped and stockpiled for later use in rehabilitation activities
- ROM stockpile and plant feed stockpile
- Product stockpile

3.4.1 Water supply

Both potable and service water will be needed for the operations throughout the life of mine. Potable water will be extracted from a borehole located on site. The water to be used at the mine will be sourced either from the local borehole on site, groundwater inflows into the opencast and underground workings, storm water dam or a combination of the above. Water management facilities for the control of storm water and for pollution prevention such as water supply dams, pollution control dams, clean and dirty storm water controls will be designed to meet the requirements of relevant legislation. Recycling dirty/process water will be priority.

Total estimated water consumption (usage) of 50 m³/Hr.

A geohydrological study will be undertaken during the EIA Phase to assess the groundwater regime. A WULA, accompanied by an Integrated Water and Waste Management Plan (IWWMP), is being applied for as part of the Environmental Authorisations for the Mining Right.

3.4.2 Power supply

The total maximum demand of 10.55 MW is comprised of 3.55 MW for the plant and 7 MW for the underground and ancillary power requirements. The total average power requirement of the mine is estimated at some 8MW.



Power will be supplied from either generator or through Eskom.

3.4.3 Wash plant

As part of the proposed mining project a wash plant is proposed.

The plant is designed to treat 30 000 to 50 000 tons ROM per month, based on the following criteria:

- Running Time:
 - 22 Hrs per day (accounting 2 hours for unplanned stoppages, maintenance, and breakdowns)
 - 28 Days per month
 - 616 Hrs running time per month
- At a feed rate of approximately 70 to 100 tons/hr, 30,000 to 50,000 tons/month can be treated.

The material flow and processing sections are described in more detail below:

3.4.3.1 ROM to Classification Plant

The Run of Mine (ROM) ore, from the opencast or underground workings are stockpiled on the ROM stockpile (SP01) with a base not less than 40 m in diameter and a height of 18 m. The ROM stockpile should have a capacity of 7,000 tons and 4,000 ton live. The stockpile consists of a base and a concrete reclaim tunnel 3 m wide, 2.5 m high and \pm 40 m long. The tunnel will be equipped with 4 brute force vibrating feeders (VF 01-04) with VSD control. Each feeder will have a capacity of 300 tons per hour. The ore from the stockpile will be fed via the vibrating feeders onto a 900 mm conveyor belt (CV01) feeding a scalping screen (SC01) in the crushing plant. CV01 will be equipped with a weight meter (WT01) with 6 in line idlers and range between 0 – 300 tons/hr.

The crushing and screening plant is designed to crush ore down to 100% < 80mm and stockpiled on the plant feed stockpile (SP02).

The plus 80 mm ore reports directly to a Jaw crusher. The Jaw crusher product reports to a 750 mm wide conveyor (CV02). CV02 discharges via a chute onto the crusher feed conveyor CV01.

The scalping screen undersize reports to a 900mm wide conveyor belt CV03 and discharge the ore onto to plant feed stockpile SP02.

The crushing and screening plant will be operated in isolation from the rest of the plant.

The plant is designed for a feed rate between 70 and 250 tons/hour and a recycling load of between 25 and 66 tons/hr.

The ore from the plant feed stockpile reports via CV04 to the lumpy classification screen (SC03). Water from the magnetic separators) or “magsep” (non-magnetic) underflow will be pumped to CV04 head chute feeding SC03. SC03 is also equipped with two spray bars. Clean process water from the process water dam will be used as spray water on the screen to wash off all fines from the lumpy ore prior to HMS.

3.4.3.2 Heavy Medium Separation

The objective of the heavy medium separation plant is to separate the chromite ore from the waste ore by using ferrosilicon as a medium. Due to the differences in SG of the chromite and the waste ore the chromite ore will sink, and the waste will float at a specific SG of the medium.

The lumpy ore (19 x 80mm) from the lumpy classification screen (SC03) reports to the H.M.S drum, together with ferrosilicon slurry (FeSi) from pump (PU02), where separation takes place.



The HMS drum discharges onto a split drain and rinse screen (1.83m x 4.88m horizontal vibrating screen) fitted with 0.85mm slotted polyurethane panes and spray bars fitted on the latter half of the screen.

The FeSi drains through the first quarter of the screen into a sump from where it is circulated back to the drum via pumps (PU02). Water from the spray bars, fitted to latter halve of the screen, washes all the FeSi from the ore and drains into a sump from where it is pumped by (PU03) to the magnetic separator (MS01) to recover the FeSi. The non-magnetics from the magnetic separators flow to pump PU06 and pumped to CV04 head chute as dilution water.

3.4.3.3 Milling

A ball mill with 250kw drive will be sufficient to mill 36 tons/hr chrome pebbles down to 100% -1mm. From the mill feed bin, the chromite chips will be fed to the mill with a weigh feeder (CV10) at a rate of 20 – 36 tons/hr. The weigh feeder discharges the chips into the mill feed hopper with dilution water. The mill discharges the slurry via a trammel screen in a pump sump from where it is pumped by the mill discharge pump PU07 to the spiral feed pump (PU01).

3.4.3.4 Spiral Plant

All the -0.85mm material from the fines classification screen (SC04) together with the mill effluent are pumped to a 3-way distributor on top of the spiral plant. Each stream will feed a bank of 10 twin start 3 turn rougher spirals (in total 30 twin start rougher) spiral.

The middling's and tailings of each rougher bank feed a bank of 8 twin start scavenger spirals via a launder and multi-distributor.

The tails of the scavenger spirals report to the tailings pump (PU13). The concentrate from the cleaner's report to the re-cleaner feed pump (PU08). The tailings from the cleaners together with the concentrate of the scavenger's report to the middling's pump PU09. The re-cleaner feed pump PU08 pump to 1 bank of 12 twin-start spirals. The concentrate of the re-cleaners reports via a launder to the Chemgrade product pump (PU11). The middlings of the re-cleaner's report via a launder and multi-distributor to 1 bank of 10 re-re-cleaner spirals. The concentrate of this spirals report via a launder to the Derrick Screen feed pump (PU12) and to a 3 deck Derrick screen stack-sizer to produce Foundry grade concentrate. The product from the Derrick Screen reports to the F/s product pump.

The middling's feed pump pumps to 1 bank of 10 twin-start Middling spirals via a 20-way multi- distributor. The concentrate of these spirals and the tailings of the re-cleaner's report to 1 bank of 10 mid-cleaner spirals and the tailings of the Middling spirals report to the tailings pump.

The re-re-cleaner middlings/tails and the mid-cleaner tails report to the Rougher feed pump (PU09). The concentrate and middlings from the Middling cleaners report via launders to the Met grade product pump.

The Met grade-, Chemgrade- and Foundry sand Products, are pumped to a concrete stockpile area via De-watering Cyclones. The water from these cyclones and the drain water from the concentrate stockpiles are collected and pumped via pump (PU14) to the spiral plant steady head tank to be used as launder dilution water. The steady head tank will have a level controller controlling an automatic valve on the make-up water pipeline from the process water dam.

3.4.3.5 Tailing Handling

The tailings pump (PU13) pumps to a guard cyclone (CY05). The cyclone underflow reports to a 1,220m x 3,050m dewatering screen (SC07) next to the waste conveyor CV06. The dewatering screen is a 1,220m x 3,660m. The dewatered tails (sand), from the screen reports to the lumpy waste conveyor and will be stock piled with the solid waste on the waste stockpile. The guard cyclone overflow reports to a 12m diameter conventional thickener.



Flocculent will be dosed into the tailings stream prior to the thickener. The thickened tailings, (thickener underflow) will be pumped to the slimes dam or to a PGM recovery plant (not part of this project now). The slimes dam should not be smaller than 100m x 100m. The return water from the slimes dam is pumped to the clean water tank at the plant area. The thickener overflow (clean water) reports to a steel process water dam ± 15m diameter and 3 m deep (530m³) from where it is pumped to the different sections of the plant.

A simplified process flow diagram of the plant is indicated in Figure below.

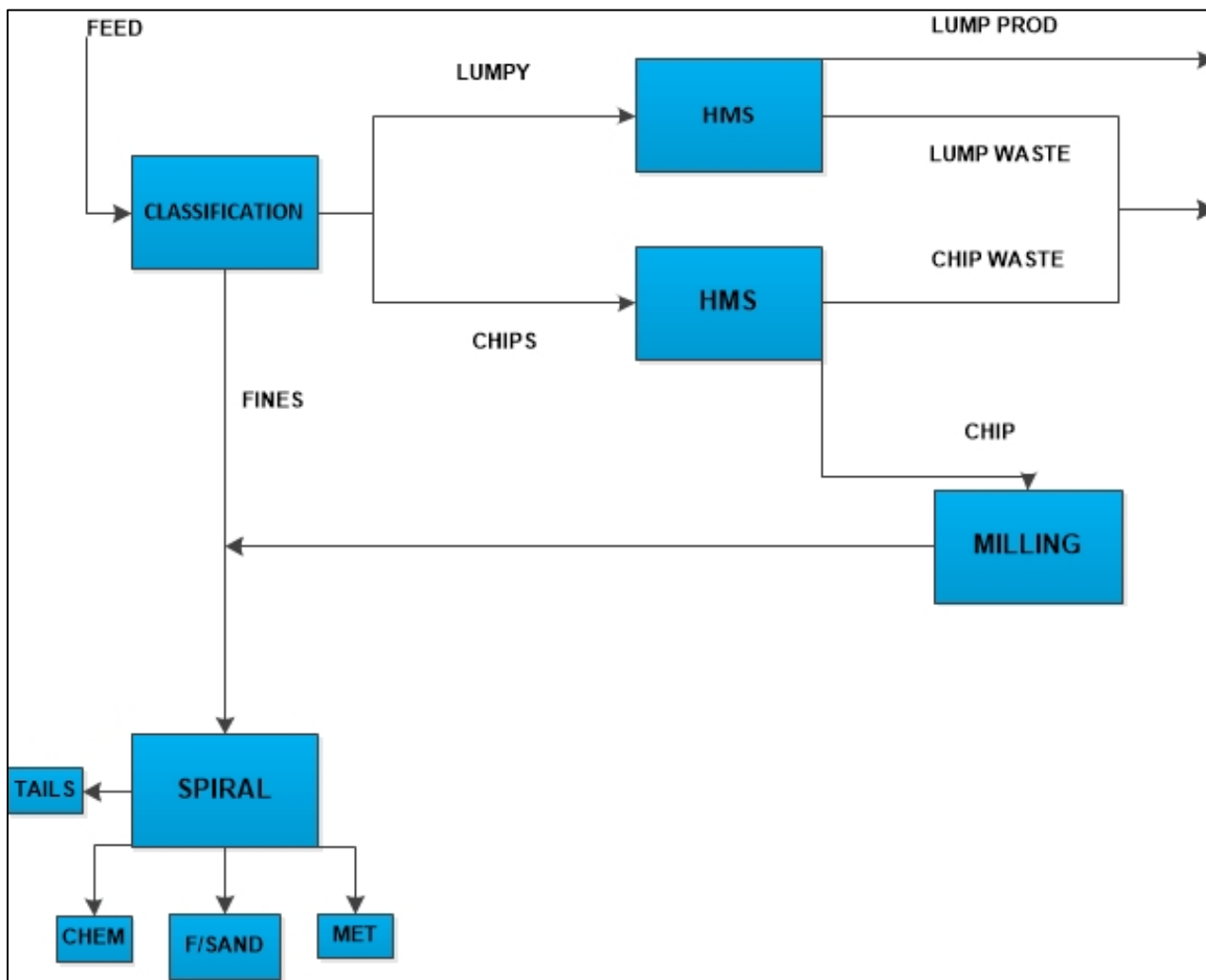


Figure 5: Flow diagram of the proposed plant

3.4.4 Waste management

The waste generated by the proposed activities are divided into 3 main categories, and are discussed below in summary.

3.4.4.1 General Waste

The identified general waste types to be generated on site are the following:

- Scrap metal & timber
- Cans, paper, plastic and cardboard
- Inert waste
- Garden waste

3.4.4.2 Tailings

Wet tailings from the wash plant will be allowed to dry on cement drying slabs. This is done to facilitate the maximum



recovery of water to be reused at the plant. Once tailings have dried sufficiently, they will be transferred to the dry tailings stockpile. The facility will be constructed with the appropriate barrier as prescribed by the Competent Authority. The wash plant, and tailings facility are considered dirty areas and such all water emanating from this area will be contained in a PCD for reuse in the wash plant process.

As part of this application, it is proposed to use tailings for backfilling of the opencast voids as part of the rehabilitation efforts of the mine. In order to maximise recycling, and thereby reducing waste materials stockpiled on site.

When economically viable the mine also proposes to sell the tailings material to third parties for further reclamation at off-site operations.

3.4.4.3 Hazardous Waste

Potentially Hazardous waste types that may occur on site include:

- Any tar containing waste
- Any resin containing waste
- Fluorescent light tubes
- Oil (used and clean)
- Degreaser
- Explosives
- Brake fluid
- Transmission fluid
- Sewage

All the above-mentioned wastes will be handled to guidelines given by the competent authority.



4 POLICY AND LEGISLATIVE CONTEXT

Relevant South African legislation requires various authorisations prior to the commencement of the Proposed Project. Although cognisance of all applicable legislation is being taken, the following table details the relevant environmental authorisations, which are required:

Table 3: Competent Authorities

Authorisation	Responsible Department	Relevant Act
Mining Right Application	DMR	MPRDA
Environmental Authorisation		NEMA
Waste Management License		NEMWA
Water Use License	DWS	NWA

As part of the Scoping Phase, and to ensure all relevant South African legislation was taken into consideration, the following legislation was considered relevant as part of the overall ESIA Process to ensure legal compliance and best practice.

- The Constitution of the Republic of South Africa (No. 108 of 1996)
- Mineral and Petroleum Resources Development Act (No. 28 of 2002)
- National Environmental Management Act (No. 107 of 1998)
- National Water Act (No. 36 of 1998)
- National Environmental Management Biodiversity Act (No. 10 of 2004)
- National Environmental Management Protected Areas Act (No. 57 of 2003)
- National Environmental Management Air Quality Act (No. 39 of 2004)
- National Environmental Management Waste Act (No. 59 of 2008)
- National Heritage Resources Act (No. 25 of 1999)
- National Forests Act (No. 84 of 1998)
- Fencing Act (No. 31 of 1963)
- Hazardous Substances Act (No. 15 of 1979)
- Occupational Health and Safety Act (No. 85 of 1993)
- Mine Health and Safety Act (No. 29 of 1996)
- Provincial Ordinances and Municipal By-laws
- Guidelines

Table 4: Applicable Legislation relevant to the Proposed Project

Applicable legislation and guidelines use to compile the report	Application
<p>Constitution of the Republic of South Africa (No. 108 of 1996) Since 1994 South African legislation, including environmental legislation, has undergone a large transformation and various new laws and policies was promulgated with a strong emphasis on environmental concerns and the need for sustainable development. The Constitution of the Republic of South Africa (No. 108 of 1996) (the Constitution), the supreme law in South Africa, contains far reaching clauses relevant to the environment including the environmental right, the administrative justice clause, the access to information right as well as the liberalisation of <i>locus standi</i> rule.</p> <p>In terms of Section 24, a positive obligation is placed on the State to give effect to the environmental right. The environmental right states that:</p>	<p>The purpose of the ESIA Process is to identify activities that may cause environmental and socio-economic damage from the associated impacts occurring as a result of the proposed project. The impacts will be assessed, evaluated and mitigation measures developed to minimise the negative impacts and promote positive impacts associated with the proposed project, thereby ensuring that the project is undertaken in a sustainable manner. This</p>



Applicable legislation and guidelines use to compile the report	Application
<p><i>“Everyone has the right - To an environment that is not harmful to their health or well-being; and To have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that:</i></p> <ul style="list-style-type: none"> <i>- Prevent pollution and ecological degradation;</i> <i>- Promote conservation; and</i> <i>- Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.”</i> 	<p>also ensures that the applicant does not contravene Section 24 of the Constitution.</p> <p>The Constitution cannot manage environmental resources as a stand-alone piece of legislation hence additional legislation has been promulgated in order to manage the various spheres of both the social and natural environment. Each promulgated Act and associated Regulations are designed to focus on various industries or components of the environment to ensure that the objectives of the Constitution are effectively implemented and upheld on an ongoing basis throughout South Africa. In terms of Section 7, a positive obligation is placed on the State to give effect to the environmental rights.</p>
<p>Mineral and Petroleum Resources Development Act (No. 28 of 2002)</p> <p>The primary aim of the MPRDA is to recognise the sovereignty of the State over all the mineral and petroleum resources in South Africa and to promote equitable access to the Country’s resources. The MPRDA has a number of objectives, including to:</p> <p>Promote equitable access to the nation’s mineral and petroleum resources to all the people of South Africa;</p> <p>Substantially and meaningfully expand opportunities for historically disadvantaged persons, including women, to enter the mineral and petroleum industries and to benefit from the exploitation of the nation’s mineral and petroleum resources;</p> <p>Promote economic growth and mineral and petroleum resources development in the country;</p> <p>Provide for security of tenure in respect of prospecting, exploration, mining and production operations;</p> <p>Give effect to Section 24 of the Constitution of South Africa by ensuring that the nation’s mineral and petroleum resources are developed in an orderly and ecologically sustainable manner while promoting justifiable social and economic development; and</p> <p>Ensure that holders of mining and production rights contribute towards the socio-economic development of the areas in which they are operating.</p> <p>The MPRDA concerns equitable access to, and sustainable development of, South Africa’s mineral and petroleum resources. The MPRDA makes provision for sustainable mining and requires:</p> <p>That every person who has applied for a mining right must conduct an EIA, determine the environmental baseline, and submit an EMPR to the DMR;</p>	<p>In accordance with section 22 of the MPRDA, the applicant is required to conduct a Scoping and Environmental Impact Report Process and submit an EMPR for approval to the Limpopo DMR. Red Kite Environmental Solutions has compiled the Environmental Impact Assessment and Environmental Management Programme Report in accordance with the MPRDA and NEMA.</p>



Applicable legislation and guidelines use to compile the report	Application
<p>That every holder of a mining reconnaissance permit, prospecting right, mining right, mining permit or retention permit must assess and communicate the impacts of the activity on the environment;</p> <p>The need to rehabilitate the environment affected by prospecting or mining operations to its natural or predetermined state; and</p> <p>That the directors of the mining company are liable for unacceptable impacts on the environment.</p>	
<p>National Environmental Management Act (No. 107 of 1998)</p> <p>The NEMA is South Africa’s overarching environmental statute concerned with integrated environmental management (IEM) and the underlying principles by which environmental management must be undertaken. Its primary objective is to provide for co-operative governance, thus binding all organs of State by establishing principles for decision making on matters affecting the environment, institutions that will promote co-operative governance, and procedures for co-ordinating environmental functions exercised by organs of State and to provide for matters connected therewith (Government Gazette, 1998).</p> <p>The NEMA provides for the Constitutional right to an environment that is not harmful to the health and well-being of South African citizens, the equitable distribution of natural resources, sustainable development, environmental protection, and the formulation of environmental management frameworks (Government Gazette, 1998). Section 2 of NEMA sets out principles for sustainable integrated environmental governance; the principles are further detailed in subsequent sections of NEMA.</p> <p>Section 24(5), 24M and 44 of the NEMA enables the Minister to publish regulations pertaining to environmental impact assessments. The current Environmental Impact Assessment Regulations, GNR.326 (EIA Regulations), were published on 7 April 2017. Sections 24(2) and 24D of the NEMA make provision for the Minister to publish listed activities that would require environmental authorisation prior to commencement of that activity. The Minister published the following three Regulations in terms of Sections 24(2) and 24D of the NEMA on 4 December 2014:</p> <p>Regulation GNR.327 of 2017 which sets out a list of identified activities which may not commence without environmental authorisation from the competent authority and which must follow the Basic Assessment (BA) procedure as provided for in Chapter 4, Part 2 of the EIA Regulations;</p> <p>Regulation GNR.325 of 2017 which sets out a list of identified activities which may not commence without environmental authorisation from the competent authority and which must follow the scoping and EIA procedure as provided for in Chapter 4, Part 3 of the EIA Regulations; and</p> <p>Regulation GNR.324 of 2017, which sets out a list of identified activities per geographical area, which may not commence without environmental authorisation from the competent authority and which must follow the BA procedure as, provided for in Chapter 4, Part 2 of the EIA Regulations.</p>	<p>In terms of Section 24(2) and 24(D) of the NEMA, authorisation is required for the following listed activities identified in terms of the following, which is detailed in Section 2(d)(i):</p> <p>GN325(17)</p> <p>GN325(6)</p> <p>GN325(27)</p> <p>GN325(15)</p> <p>GN327(12)</p>



Applicable legislation and guidelines use to compile the report	Application
<p>National Environmental Management Waste Act (No. 59 of 2008)</p> <p>The National Environmental Management Waste Act (No. 59 of 2008) (NEMWA) serves to reform the law regulating waste management in order to protect human health and the environment. This is managed by providing reasonable measures for the prevention of pollution and ecological degradation. The Act aims to secure ecologically sustainable development while promoting justifiable economic and social development. The Act provides national norms and standards for regulating the management of waste by all spheres of government, for specific waste management measures and for matters incidental thereto.</p> <p>In terms of the NEMWA, the Minister of the DEA may publish a list of waste management activities that have, or are likely to have, a detrimental effect on the environment. Furthermore, the NEMWA prohibits any person to commence, undertake or conduct a waste management activity except in accordance with the requirements or standards determined in terms of the NEMWA for that activity or where a WML has been issued in respect of that activity.</p> <p>A list of waste management activities that require a WML was published in GNR.921 of 2013. GNR.921 details three categories of activities: Category A activities, which require a BA process in terms of GNR.327 to be undertaken, and Category B activities, which require a scoping and EIA process in terms of GNR.325 to be undertaken, and Category C activities require compliance with relevant Norms and Standards.</p>	<p>The following activity is considered applicable to the Proposed Project, as detailed in Section 2(d)(i): GNR.921, Category B, Activity 11</p>
<p>National Water Act (No. 36 of 1998)</p> <p>The NWA provides for fundamental reformation of legislation relating to water resources and use. The preamble to the Act recognises that the ultimate aim of water resource management is to achieve sustainable use of water for the benefit of all users and that the protection of the quality of water resources is necessary to ensure sustainability of the nation’s water resources in the interests of all water users. The purpose of the Act is stated, in Section 2 as, inter alia:</p> <p>Promoting the efficient, sustainable and beneficial use of water in the public interest; Facilitating social and economic development; Protecting aquatic and associated ecosystems and their biological diversity; Reducing and preventing pollution and degradation of water resources; and Meeting international obligations.</p> <p>The NWA presents strategies to facilitate sound management of water resources, provides for the protection of water resources, and regulates use of water by means of Catchment Management Agencies, Water User</p>	<p>As required by Section 40 of the NWA, the following water uses will require a WULA in terms of Section 21 the NWA, of which the Limpopo DWS will be responsible for granting. It is understood that no aspects of the project may commence prior to receipt of the relevant WUL:</p> <ul style="list-style-type: none"> • Section 21 (a) for the abstraction of groundwater; • Section 21(c) for impeding the flow in a water course; • Section 21(g) for the disposing of waste in a manner that may detrimentally impact on a water resource; • Section 21(i) for altering the bed, banks, course or natural characteristics of a watercourse; and



Applicable legislation and guidelines use to compile the report	Application
<p>Associations, Advisory Committees and International Water Management.</p> <p>As this Act is founded on the principle that the government has overall responsibility for and authority over water resource management, including the equitable allocation and beneficial use of water in the public interest, an industry (including mines) is only entitled to use water if the use is permissible under the NWA.</p> <p>Section 21 of the NWA provides a list of water uses which require a WULA prior to commencement, unless listed in Schedule 1 (of the NWA) as an existing lawful use. Applying for a WULA triggers NEMA listed activities as contemplated in terms of GNR.984 and GNR.985 of 2014.</p> <p>Water use includes taking and storing water, activities which reduce stream flow, waste discharges and disposals, controlled activities (activities which impact detrimentally on a water resource), altering a watercourse, removing water found underground for certain purposes, and recreation. A water use must be licensed unless it is listed in Schedule 1 (of the NWA), is an existing lawful use, is permissible under a general authorisation, or if a responsible authority waives the need for a license.</p> <p>In terms of the NWA, a watercourse is defined as follows: A river or spring; A natural channel in which water flows regularly or intermittently; A wetland, lake or dam into which the Minister may, by notice in the Gazette, declare to be a watercourse, and reference to a watercourse, which includes, where relevant, its beds and banks.</p> <p>Furthermore, in terms of the NWA, a wetland is defined as follows: Land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil.</p>	<ul style="list-style-type: none"> Section 21 (j) for removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people.
<p>Government Notice Regulation 704 of 1999</p> <p>GNR.704 of 1999 under the NWA provides regulations on the use of water for mining and related activities aimed at the protection of water resources (requirements for clean and dirty water separation). GNR.704 requires inter alia the following: Separation of clean (unpolluted) water from dirty water; Collection and confinement of the water arising within any dirty area into a dirty water system; Design, construction, maintenance and operation of the clean water and dirty water management systems so that it is not likely for either system to spill into the other more than once in 50 years; Design, construction, maintenance and operation of any dam that forms</p>	<p>Cognisance has also been taken with regards to Regulation 4, Regulation 6 and Regulation 7 of GNR.704. A storm water management plan will be developed for the proposed mining activities that identifies 'dirty' and 'clean' areas within the site. All 'dirty' areas will be constructed within a cut-off trench and routed to a pollution control dam (PCD). The water within the PCD may be used for processes, potable water and dust</p>



Applicable legislation and guidelines use to compile the report	Application
<p>part of a dirty water system to have a minimum freeboard of 0.8m above full supply level, unless otherwise specified in terms of Chapter 12 of the Act; and</p> <p>Design, construction, and maintenance of all water systems in such a manner as to guarantee the serviceability of such conveyances for flows up to and including those arising as a result of the maximum flood with an average period of recurrence of once in 50 years.</p> <p>GNR.704 also stipulates that no person in control of a mine or activity may:</p> <p>Locate or place any residue deposit, dam, reservoir, together with any associated structure or any other facility within the 1:100 year flood line or within a horizontal distance of 100 m from any watercourse or estuary, borehole or well, excluding boreholes or wells drilled specifically to monitor the pollution of groundwater, or on water-logged ground, or on ground likely to become water-logged, undermined, unstable or cracked;</p> <p>Place or dispose of any residue or substance which causes or is likely to cause pollution of a water resource, in the workings of any underground or opencast mine excavation, prospecting diggings, pit or any other excavation; or</p> <p>Use any area or locate any sanitary convenience, fuel depots, reservoir or depots for any substance which causes or is likely to cause pollution of a water resource within the 1:50 year flood line of any watercourse or estuary.</p>	<p>suppression.</p>
<p>National Environmental Management Air Quality Act (No. 39 of 2004)</p> <p>The National Environmental Management Air Quality Act (No. 39 of 2004) (NEMAQA) allows for national, provincial and local air quality standards to be established as well as the declaration of priority areas. In addition, the NEMAQA requires that Air Quality Management Plans (AQMP) form part of the environmental implementation plan or environmental management plans to be prepared by national departments or the Province as required by Chapter 3 of the NEMA. Furthermore, the NEMAQA requires municipalities to include an AQMP into its integrated development plan (IDP).</p> <p>The NEMAQA requires the Minister of the DEA to publish a list of activities which results in atmospheric emissions which may have a detrimental effect on the environment, including health, social conditions, economic conditions, ecological conditions, ecological conditions or cultural heritage. The NEMAQA requires that an atmospheric emissions licence (AEL) be obtained for such listed activities. Such a list of activities was published in GNR.248 of 2010.</p>	<p>No activities requiring authorisation in terms of GNR.248 of 2010 of NEMAQA will be undertaken.</p>
<p>National Environmental Management Biodiversity Act (No. 10 of 2004)</p> <p>In line with the Convention on Biological Diversity, the National Environmental Management Biodiversity Act (No. 10 of 2004) (NEMBA) aims to legally provide for biodiversity conservation, sustainable use and</p>	<p>One of the objectives of this Act is to provide for the management and conservation of South Africa's biodiversity</p>



Applicable legislation and guidelines use to compile the report	Application
<p>equitable access and benefit sharing. The Act establishes the South African National Biodiversity Institute (SANBI). The NEMBA creates a basic legal framework for the formation of a national biodiversity strategy and action plan and the identification of biodiversity hotspots and bio-regions which will then be given legal recognition. It imposes obligations on landowners (state or private) governing alien invasive species as well as regulates the introduction of genetically modified organisms. Furthermore, the Act serves to regulate bio-prospecting, making provision for communities to share the profits of any exploitation of natural materials involving indigenous knowledge.</p> <p>A restricted activity is defined by the NEMBA as, inter alia:</p> <p>In relation to a specimen of a listed threatened or protected species:</p> <ul style="list-style-type: none"> - Hunting, catching, capturing or killing any living specimen of a listed threatened or protected species by any means, method or device whatsoever, including searching, pursuing, driving, lying in wait, luring, alluring, discharging a missile or injuring with intent to hunt, catch, capture or kill any such specimen; - Gathering, collecting or plucking any specimen of a listed threatened or protected species; - Picking parts of, or cutting, chopping off, uprooting, damaging or destroying, any specimen of a listed threatened or protected species; - Having in possession or exercising physical control over any specimen of a listed threatened or protected species; and - Conveying, moving or otherwise translocating any specimen of a listed threatened or protected species. <p>In relation to a specimen of an alien species or listed invasive species:</p> <ul style="list-style-type: none"> - Importing into the Republic, including introducing from the sea, any specimen of an alien or listed invasive species; - Having in possession or exercising physical control over any specimen of an alien or listed invasive species; - Growing, breeding or in any other way propagating any specimen of an alien or listed invasive species, or causing it to multiply; and - Conveying, moving or otherwise translocating any specimen of an alien or listed invasive species. <p>Sections 52(1)(a) and 56(1) of the NEMBA state that the Minister may publish national lists of species and ecosystems, respectively, that are threatened or are in need of protection. A list of species that are threatened or are in need of protection was published in 2013 in GNR.389, with GNR.388 detailing the regulations relating to such species. These regulations are imposed where restricted activities involve specimens of listed threatened or protected species. GNR.388 defines the requirements of permitting and the process related thereto.</p> <p>GNR.1002, published in 2011, contains the first national list of</p>	<p>within the framework of the NEMA and to ensure the sustainable use of indigenous biological resources. In addition to regulations on Threatened, Protected, Alien and Invasive Species in South Africa, the National Biodiversity Strategies and Action Plans (NBSAP) was formulated under the National Spatial Biodiversity Assessment (NSBA) and was used to identify Terrestrial and Aquatic Priority Areas and Threatened Ecosystems for biodiversity conservation.</p> <p>Chapter 4, Part 2 (Threatened and Protected Species Regulations) of NEMBA provides for listing of species that are threatened or in need of protection to ensure their survival in the wild, while regulating the activities, including trade, which may involve such listed threatened or protected species and activities which may have a potential impact on their long-term survival. In February 2007, this was achieved as the Minister of DEA published a list of Critically Endangered, Endangered, Vulnerable and Protected Species, according to Section 56(1) of the Act.</p>



Applicable legislation and guidelines use to compile the report	Application
<p>threatened terrestrial ecosystems and provides supporting information to accompany the list, including the purpose and rationale for listing ecosystems, the criteria used to identify listed ecosystems, the implications of listing ecosystems, and summary statistics and national maps of listed terrestrial ecosystems. It also includes individual maps and detailed information for each listed ecosystem.</p>	
<p>National Environmental Management Protected Areas Act (No. 57 of 2003)</p> <p>The National Environmental Management Protected Areas Act (No. 57 of 2003) (NEMPAA) concerns the protection and conservation of ecologically viable areas representative of South Africa’s biological diversity and its natural landscapes and seascapes, and includes inter alia:</p> <p>The establishment of a national register of all national, provincial and local protected areas;</p> <p>The management of those areas in accordance with national standards; and</p> <p>Inter-governmental co-operation and public consultation in matters concerning protected areas.</p> <p>The ESIA will take cognisance of the NEMPAA in order to ensure compliance with South African legislation.</p> <p>The NEMPAA defines various kinds of protected areas, namely: special nature reserves, national parks, nature reserves (including wilderness areas) and protected environments, world heritage sites, marine protected areas, specially protected forest areas, forest nature reserves and forest wilderness areas declared in terms of the National Forests Act (No. 84 of 1998), and mountain catchment areas declared in terms of the Mountain Catchment Areas Act (No. 63 of 1970).</p> <p>Part 4 of Chapter 4 of the NEMPAA (Sections 48 to 53) lists restrictions of activities that may not be conducted in a protected area (as described above). Activities that are restricted include:</p> <p>Prospecting and mining activities;</p> <ul style="list-style-type: none"> - Activities that are restricted by: <p>Regulations made by the Minister;</p> <p>Regulations made by the MEC, in the case of provincial and local protected areas;</p> <p>By-laws of the relevant municipality, in the case of local protected areas; and</p> <p>Internal rules made by the managing authority of the area;</p> <ul style="list-style-type: none"> - Commercial and community activities where the survival of any species is negatively affected, or the integrity of an ecosystem is significantly disrupted; and - Any development or other activity that is inappropriate for the area given the purpose for which the area was declared. 	<p>Cognisance will be taken of existing and proposed protected environments.</p>



Applicable legislation and guidelines use to compile the report	Application
<p>National Heritage Resources Act (No. 25 of 1999)</p> <p>The National Heritage Resources Act (No. 25 of 1999) (NHRA) established the South African Heritage Resources Agency (SAHRA) in 1999. SAHRA is tasked with protecting heritage resources of national significance. With regard to heritage sites, sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, dolomitic land and ridges, estuaries, wetlands, and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure. A heritage site means a place declared to be a national heritage site by SAHRA or a place declared to be a provincial heritage site by a provincial heritage resources authority.</p>	<p>Section 34 and 38 of the NHRA details specific activities that require a heritage impact assessment that will need to be approved by SAHRA. The following activities require a heritage impact assessment to be undertaken for the Proposed Project. The heritage specialist study has commenced, and the results will be provided in the EIA/ EMPR document.</p> <p>Section 34(1): Structures older than 60 years may not be altered or demolished prior to permission from SAHRA;</p> <p>Section 38(1a): The construction of a road, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length;</p> <p>Section 38(1c): Any development or other activity which will change the character of a site (i) exceeding 5,000 m² in extent, or (ii) involving three or more erven or subdivisions; and</p> <p>Furthermore, section 48(2) requires a permit from a heritage resources authority to perform such actions at such time and subject to such terms, conditions and restrictions or directions as may be specified in the permit. This would include any development of the site where “development” means any physical intervention, excavation, or actions, other than those caused by natural forces, which results in a change to the nature, appearance or physical nature of a place, or influences its stability and future well-being, including:</p> <p>Construction, alteration, demolition, removal or change of use of a place or a structure at a place;</p> <p>Carrying out any works on or over or under a place;</p> <p>Any change to the natural or existing condition or topography of land; and</p> <p>Any removal or destruction of trees, or removal of vegetation or topsoil.</p>
<p>National Forest Act (No. 84 of 1998)</p>	



Applicable legislation and guidelines use to compile the report	Application
<p>The purpose of the NFA is as follows: Promotion of the sustainable management and development of forests for the benefit of all; Creation of the conditions necessary to restructure forestry in the State's forests; Provision of special measures for the protection of certain forests and trees; Promotion of the sustainable use of forests for environmental, economic, educational, recreational, cultural, health and spiritual purposes; Promotion of community forestry; and Promotion of greater participation in all aspects of forestry and the forest products industry by persons disadvantaged by unfair discrimination.</p> <p>One of the objectives of this Act is to provide special measures for the protection of certain forests and tree species and to promote the sustainable use of forests for environmental, economic, educational, recreational, cultural, health and spiritual purposes. Section 15(1) – No protected tree may be cut, disturbed, damaged, destroyed and their products may not be possessed, collected, removed, transported, exported, donated, purchased or sold; except under license granted by the DWS/ DEA (or a delegated authority). GNR.767 of 2005 and GNR.716 of 2012 comprise lists of protected tree species under the National Forests Act (No. 84 Of 1998). The criteria used to select tree species for inclusion in the protected tree list are: Red List Status (rare or threatened species); Keystone Species Value (whether species play a dominant role in an ecosystem's functioning); Sustainability of Use (whether a species is threatened by heavy use of its products such as timber, bark etc.); Cultural or Spiritual Importance (outstanding landscape value or spiritual meaning attached to certain tree species); and Other legislation (whether a species is already adequately protected by other legislation).</p>	<p>One of the objectives of this Act is to provide special measures for the protection of certain forests and tree species and to promote the sustainable use of forests for environmental, economic, educational, recreational, cultural, health and spiritual purposes. In terms of Section 15(1) of the National Forests Act (no.84 of 1998), protected tree species may not be cut, disturbed, damaged, destroyed and their products may not be possessed, collected, removed, transported, exported, donated, purchased or sold – except under license granted by the relevant authority.</p> <p>The potential for specific protected forests and tree species may occur within the project area and cognisance needs to be taken of the NFA.</p>
<p>Fencing Act (No. 31 of 1963) The aim of the Fencing Act (No. 31 of 1963) is to consolidate the laws relating to fences and the fencing of farms and other holdings. When a landowner erects a fence in a designated area, he/ she may insist that the adjacent owner contribute towards the erection or maintenance costs. In areas where contributions are not mandatory/ have not been published in the Government Gazette, a contribution can be claimed from the adjacent owner if the fence offers beneficial use for such a person. The Act also makes provision for a mechanism to deal with disputes between adjacent owners regarding a contribution towards erecting or repairing a fence.</p>	<p>Of specific importance, section 17 requires that any person erecting a boundary fence may clean any bush along the line of the fence up to 1.5 metres on each side thereof and remove any tree standing in the immediate line of the fence. However, this provision must be read in conjunction with the environmental legal provisions relevant to the protection of flora.</p>
<p>Hazardous Substances Act (No. 15 of 1979) The object of the Act is inter alia to 'provide for the control of substances</p>	<p>Dangerous substances contained onsite</p>



Applicable legislation and guidelines use to compile the report	Application
<p>which may cause injury or ill health to, or death of, human beings by reason of their toxic, corrosive, irritant, strongly sensitising or flammable nature or the generation of pressure thereby in certain circumstances; for the control of electronic products; for the division of such substances or products into groups in relation to the degree of danger; for the prohibition and control of such substances.'</p> <p>In terms of the Act, substances are divided into schedules, based on their relative degree of toxicity, and the Act provides for the control of importation, manufacture, sale, use, operation, application, modification, disposal and dumping of substances in each schedule.</p>	<p>during the construction, operation and closure phases of the Proposed Project will need to be management in accordance with the Act and safety data sheets (SDS) will need to accompany all dangerous goods (hydrocarbons, cleaning chemicals, paints, etc.).</p>
<p>Mine Health and Safety Act (No. 29 of 1996)</p> <p>The Mine Health and Safety Act (No. 29 of 1996) (MHSA) aims to protect and promote the health and safety of employees and persons that may be affected by the activities at a mine and outlines both the rights and responsibilities of an employer, as well as the obligations of employees working thereat.</p> <p>The MHSA was developed “to provide for protection of the health and safety of employees and other persons at mines”. That said the Act also provides and/ or promotes the following:</p> <p>A culture of health and safety;</p> <p>The enforcement of health and safety measures;</p> <p>For appropriate systems of employee, employer and State participation in health and safety matters;</p> <p>The establishment of representative tripartite institutions to review legislation, promote health and enhance properly targeted research;</p> <p>For effective monitoring systems and inspections, investigations and inquiries to improve health and safety;</p> <p>Promotion of training and human resources development;</p> <p>Regulation of employers' and employees' duties to identify hazards and eliminate, control and minimise the risk to health and safety;</p> <p>Entrenchment of the right to refuse to work in dangerous conditions;</p> <p>To give effect to the public international law obligations of the Republic relating to mining health and safety; and</p> <p>To provide for matters connected therewith.</p>	<p>The following principles are considered applicable to the Proposed Project and are detailed below:</p> <ul style="list-style-type: none"> • The primary responsibility for ensuring a health and safe working environment in the mining site is placed on the mine owner. The Act sets out in detail the steps that employers must take to identify, assess records and control health and safety hazards in the mine; • The right of workers to participate in health and safety decisions, the right to receive health and safety information, the right to training and the right to withdraw from the workplace in face of danger; • The Act requires the establishment of institutions to promote a culture of health and safety and develop policy, legislation and regulations; and • The responsibility for enforcing MHSA lies with the Mine Health and Safety Inspectorate. The Inspectorate’s powers are recast and include the power to impose administrative fines upon employers who contravene the MHSA. The Act also contains innovative approaches to the investigation of accidents, diseases and other occurrences that threaten health and safety. <p>The applicant will be required to comply with all obligations contained in the</p>



Applicable legislation and guidelines use to compile the report	Application
	MSHA.
<p>Occupational Health and Safety Act (No. 85 of 1993) The Occupational Health and Safety Act (No. 85 of 1993) (OHSA) provides a legislative framework for the provision of reasonably healthy and safe conditions in the workplace. It also places extensive legal duties on employees and users of machinery and makes major inroads on employers' and employees' common law rights.</p> <p>OHSA contains provisions that impose general obligations with regard to health and safety. More detailed and specific obligations can be found in the regulations published in terms of OHSA. These include environmental, general safety, electrical machinery, driven machinery, electrical installation, construction, asbestos, hazardous chemicals substances and noise.</p> <p>The OHSA addresses, amongst others: Safety requirements for the operation of plant machinery; Protection of persons other than persons at work against hazards to health and safety, arising out of, or in connection with, the activities of persons at work; Establishment of an advisory council for occupational health and safety; and Provisions for matters connected herewith.</p>	<p>The OHSA is applicable and states that any person involved with construction, upgrades or developments for use at work or on any premises shall ensure as far as reasonably practicable that nothing about the manner in which it is installed, erected or constructed makes it unsafe or creates a risk to health when properly used.</p>
<p>Subdivision of Agricultural Land Act (No. 70 of 1970) This Act regulates the subdivision of agricultural land and its use for purposes other than agriculture. The Directorate of Resource Conservation is responsible for the enforcement thereof. Investigations are done by the Provincial Department in support of the execution of the Act. The Act also deals with aspects associated with rezoning land.</p>	<p>If agricultural land, that is productive in terms of food and/ or fibre production, becomes subdivided in some way as to make the reduced land parcel(s) uneconomic or unsustainable, then agricultural production is diminished. Such actions should be resisted wherever possible, especially where the prevailing agricultural potential is high.</p>
<p>Promotion of Access to Information Act (No. 2 of 2000) The Promotion of Access to Information Act (No. 2 of 2000) (PAIA) recognises that everyone has a right of access to any information held by the state and by another person when that information is required to exercise or protect any right. The purpose of the Act is to promote transparency and accountability in public and private bodies and to promote a society in which people have access to information that enables them to exercise and protect their right.</p>	<p>Cognisance will be made of the PAIA.</p>
<p>Promotion of Administrative Justice Act (No. 3 of 2000) The purpose of the Promotion of Administrative Justice Act (No. 3 of 2000) (PAJA) is to govern the actions of the administration and to ensure good administrative practice, by laying down the minimum procedural requirements related to decision-making. As such, PAJA applies to all</p>	<p>Cognisance will be made of the PAJA.</p>



Applicable legislation and guidelines use to compile the report	Application
<p>actions of the administrators, in particular environmental administrators.</p> <p>Section 1 of PAJA deals with procedures to be followed in the granting, suspending or revoking of permissions (licences, grants, permits). Sections 3 and 4 of PAJA deal with fair procedure, which requires the administrator to act in a fair manner when making a decision. Section 5 of PAJA governs the provision of reasons by the administrator and determines that an administrator provide reasons after a decision has been made (or whilst taking it), in order to justify the decision.</p>	
<p>Provincial Ordinances and Municipal By-laws</p> <p>In addition to national legislation, some of South Africa's nine provinces have their own provincial biodiversity legislation, as nature conservation is a concurrent function of national and provincial government in terms of the Constitution of South Africa.</p>	<p><u>Limpopo Environmental Management Act (No. 7 of 2003):</u></p> <p>The Act aims to manage and protect the environment in the Province; to secure ecologically sustainable development and responsible use of natural resources in the Province; generally, to contribute to the progressive realisation of the fundamental rights contained in Section 24 of the Constitution of the Republic of South Africa; and to give effect to international agreements effecting environmental management which are binding on the Province.</p>
<p>Applicable Guidelines and Forums</p> <p>Relevant guidelines have been developed in order to assist in sustainable development within South Africa. The following guidelines are considered applicable to the Proposed Project.</p>	<ul style="list-style-type: none"> • Department of Water Affairs: Best Practice Guideline Series <ul style="list-style-type: none"> – DWAF: Best Practice Guideline G1: Storm Water Management; – DWAF: Best Practice Guideline G2: Water and Salt Balances; August 2006; – DWAF: Best Practice Guideline A4: Pollution Control Dams (PCDs); – DWAF: Best Practice Guideline GH: Water Reuse and Reclamation, June 2006; – DWAF: Minimum Requirements Guideline for the Handling, Classification and Disposal of Hazardous Waste, 1998; – DWAF: Minimum Requirements Guideline for the Water Monitoring at Waste Management Facilities; – SA Water Quality Guidelines –



Applicable legislation and guidelines use to compile the report	Application
	<p>Aquatic Ecosystems, 1996, and – SA Water Quality Guidelines – Domestic Water Use, 1996.</p> <ul style="list-style-type: none"> • The Mining and Biodiversity Forum of South Africa • Mining and Biodiversity Guideline • Mining and Biodiversity Forum of South Africa • Mining and Biodiversity Guideline • National Spatial Biodiversity Assessment • South Africa’s National Biodiversity Strategy and Action Plan • Threatened, Protected, Alien and Invasive Species Regulation • National Aquatic Ecosystem Health Monitoring Programme and River Health Programme • Limpopo Conservation Plan
<p>Principles of Sustainability</p> <p>According to the DMR (formerly known as the Department of Minerals and Energy) (Swart, 2007), the mining sector in South Africa aims to promote its vision of ‘sustainable development’ by enabling South Africans to make balanced and informed decisions regarding the extraction and utilisation of mineral resource, by measuring and assessing progress towards sustainable development objectives and by minimising negative impacts and optimising environmental management in the mining sector.</p> <p>The most widely accepted definition of sustainable development is provided in the World Commission of Environment and Development in its landmark report Our Common Future (the Brundtland Report) ‘development that meets the needs of the present without compromising the ability of future generations to meet their own needs.’ A core principle in sustainable development is the ‘precautionary principle’ which implies that where there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.</p> <p>According to the Australian Centre for Sustainable Mining Practices (2011), sustainable development in the mining sector suggests that investments in mining projects should be financially profitable, technically appropriate, environmentally sound and socially responsible (i.e. balance economic, environmental and social aspects and guarantee the advantage for humanity at present and in the future).</p>	<p>It is understood that the definition of sustainability may not necessarily encompass the underlying factor that a non-renewable resource will be extracted. However, principles of sustainability should be incorporated into the applicant’s corporate philosophy, including: aspects such as economy (e.g. chrome export, etc.), social (e.g. long-term job employment, skills development, implementation of the Social and Labour Plan, etc.) and environmental programmes (e.g. adequate implementation of mitigation measures, environmental offsets, etc.) in order to benefit future generations whilst meeting the needs of present citizens.</p>



Applicable legislation and guidelines use to compile the report	Application
<p>Businesses involved in extracting non-renewable resources should embrace the concept of sustainability into strategic decision-making processes and operations. In addition, responsible corporations can theoretically move towards sustainability by developing a range of appropriate socio-economic initiatives. Economic development, environmental impact and social responsibilities should be well managed, and productive relationships should exist between governments, industry and stakeholders.</p>	



5 NEED AND DESIRABILITY OF THE PROPOSED ACTIVITIES

Limpopo has rich mineral resources, making mining a critical sector of the economy of the province, contributing 22% to its GDP. Lepelle-Nkumpi LM is the second largest contributor to the district Gross Geographic Product at 13.86%; and it is the first largest contributor to mining. However, the economy's strongest sector of mining recorded a negative growth, probably due to temporary closure of the local mines. The unemployment rate of Lepelle-Nkumpi is close to half of the total economically active population (45.7 in 2017) and is higher than those of the District, Provincial and National unemployment rate.

Although there are several mines in the area, the existing resources remain unexploited. Investment in this sector is important as it brings with it investment in infrastructure, results in creation of job opportunities and generates many other economic spin-offs. The lack of economic growth in the region warrants special attention and support to optimize the available opportunities. However, cognizance should be taken of the outflow of money from the mines in the municipality to other regions.

LNLM has the slowest growth in the mining industry amongst the regional LMs and low annual employment growth rate in the mining industry. Based on GVA, LNLM has the second largest mining industry among the regional LMs. LNLM has the second largest workforce. Proportionately, it does have skilled and semi-skilled workforce. LNLM has the most competitive industry based on GVA LQ and the employment LQ amongst the region's LMs. Beneficiation of raw mineral resources and mining materials has the potential to contribute significantly to expanding the manufacturing sector.

Reduction in the unemployment rate will depend on effective intervention by public sector institutions to facilitate economic sector diversification through competitive cluster value-chain development. This implies upstream development in the manufacturing and trade sector to provide essential items in the mining supply chain by local entrepreneurs. It also implies side-stream development in the form of construction and urban renewal. This approach is consistent with the Limpopo Employment Growth and Development Plan.

The economy of the Capricorn District is a mixture of very negative features and very positive opportunities (like the enormous mining potential within the area). The region is also characterised by a high level of male absenteeism, a weak economic base, poor infrastructure, major service backlogs, dispersed human settlements and high poverty levels.

The Mphahlele Mine will be a contributor to the South African Chrome industry.

Since the world recession the market prices for ferrochrome have declined to low levels (even below cost of production at times) which have in turn caused many producers to cut back their production.

In the past South Africa was the world's biggest Ferrochrome producing country; however, this title has now been handed over to China as their cost of production is lower than the South African producers.

China is the major market for ferrochrome consumption (Stainless Steel production) although India will soon also be a prominent market. Chinese production capacity is still expanding and will require more chrome ore in the short to medium term. China has forecasted good economic growth and with new projects, expansions and urbanisation programs in place the demand for Stainless steel production in China will increase in the coming years. With increase in Stainless Steel demand and lack of domestic Chrome Ore reserves China relies heavily on Chrome Ore imports.

China accounts for 38% of the total global stainless-steel production.

China relies on South Africa for between 50%-60% of their chrome ore requirements with the balance (40%) being sourced from other countries (with higher grade chrome ore) namely Turkey, Oman, Pakistan, Sudan, India, Iran, and

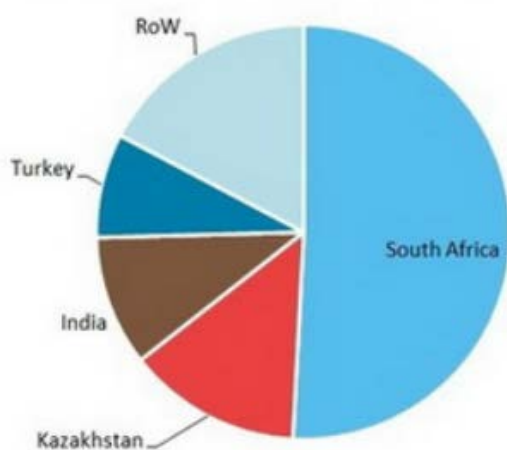


Zimbabwe.

The chrome and ferrochrome markets were forecast to rebalance in 2020, following closures and cutbacks in production from key producers as low prices persisted throughout 2019. The outbreak of COVID-19 over Q1 2020 has already begun to ripple through the chromium industry.

With the Chinese steel industry returning its furnaces into operation, available chromite stocks will only account for three months of demand, should supply be limited from South Africa and other producers moving into lockdown in order to curb the spread of COVID-19. Even if the lockdown period can be limited, the impacts of COVID-19 will likely accelerate the rebalancing expected for the chromium industry in 2020.

World Mine Production of Chromium



Chrome metal is mainly used in the production of specialty alloys, nickel and cobalt -based alloys (super alloys) where low iron is required. Due to their unique high temperature and corrosion resistance properties, these high-performance alloys are used in the most critical environments, such as aeronautic, oil & gas production, land-based turbines, petrochemical and chemical processing.

In addition, chromium metal powder is used in the production of welding electrodes and cored wires, aluminum briquettes and master alloys. (ICDACR 2015).

The proposed development of the Mphahlele Mine will entail the following positive impacts:

- Social upliftment;
- Job Creation with area;
- Growth of economy;
- Increased health services and medical assistance;
- Contribution of infrastructure within in area; and
- Educational upliftment.

Thus, from all the information given above the proposed Mphahlele Mine, if executed according to environmental guidelines and legislation should benefit the economy of SA as a whole, the people living in proximation to the mine, and all other industries dependent on mining for their income.

During the EIA Phase of the project and as part of the EIA Report the motivation regarding the Need and Desirability of the project will be expanded and discussed specifically regarding environmental aspects.



6 PERIOD FOR WHICH THE ENVIRONMENTAL AUTHORISATION IS REQUIRED

The mining Works Programme makes provision for a life of Mine (LOM) of 16 years (up to 2036), followed by 3-5 years of rehabilitation. Therefore, 21 years in total. The plant will be operational for the duration of mining activities.

7 DESCRIPTION OF THE PROCESS FOLLOWED TO REACH THE PROPOSED PREFERRED SITE

The sites for the proposed opencast mining operations were selected based on availability of the remaining chromite seams/reserves to be mined. Minerals can only be mined where identified and verified, therefore it was not practical to select any other sites.

The sites for the infrastructure related to the proposed mining operations are located at the various points which are practical for the mining and would have the least impact on the surrounding environment. The areas used for infrastructure can be altered to a greater extent in relation to receiving environment sensitivities and as such, there are areas which have been determined to be the “preferred alternatives” and those areas which can be considered.

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

1. The property on which or location where it is proposed to undertake the activity
2. The type of activity to be undertaken
3. The design or layout of the activity
4. The technology to be used in the activity
5. The operational aspects of the activity
6. The option of not implementing the activity

The details of the alternatives considered are described in the sections below. The alternatives will be investigated in detailed during the EIA Phase following completion of the relevant specialist studies.

7.1 Site Alternatives

The sites for the proposed opencast operations were selected based on availability of the Chromite seams/reserves to be mined. Minerals can only be mined where identified and verified, therefore it was not practical to select any other sites.

The sites for the infrastructure related to the proposed mining operations are located at the various points which are practical for the mining and would have the least impact on the surrounding environment. The areas used for above ground infrastructure can be altered to a greater extent in relation to receiving environment sensitivities and as such, there are areas which have been determined to be the “preferred alternatives” and those areas which can be considered “secondary alternatives”. These areas have been determined from a preliminary evaluation of how they are most optimally configured, outside of the 1:100 flood line and away from potentially sensitive areas, in favour of proposed positioning on previously disturbed farming and agricultural land. The exact details and detailed layout plans for the infrastructure has not yet been determined, and will be evaluated within the EIA process.

During the alternative analysis in the EIA phase, a detailed assessment will be done of all these areas, to determine which of the areas would be most suitable for aboveground infrastructure, taking into consideration environmental conditions, topography, financial feasibility, the linkage between pit and surface infrastructure, access to various parts of the site and existing infrastructure.



7.2 Design and Layout Alternatives

7.2.1 Waste Stockpiles and Opencast

The proposed site layout was selected using the following guidelines, as well as the criteria set in Table 6:

- taking the position of the chromitite ore body into account;
- taking areas that have been previously disturbed into account;
- to suit the mine process flow. The process flow requires that the run of mine (ROM) is fed from the opencast area to the ROM stockpile which is situated near the plant. The selected site location prevents unnecessary material handling and ensures a compact arrangement; and
- the specific ecological sensitivities of the site in question (e.g. site biodiversity, proximity to water resources, presence/absence of elements of cultural or historic significance and/or the presence/absence of high agricultural potential soils).

The consideration of layout alternatives must also, however, ensure that such alternatives are also indeed reasonable and feasible in respect of the logistical, engineering and financial constraints applicable to the project. With this in mind, layout alternatives were considered for the placement of what were deemed to be the major surface structures and infrastructure associated with the project; where the greatest opportunity to minimise environmental impacts was identified.

Consideration will be given to the placement of the various new activities in relation to –

- The extent to which the placement thereof fragments soils with high agricultural potential;
- The extent to which the placement of the mine stockpiles can be consolidated with respect to
 - the potential, collective, visual intrusion thereof on the landscape, as well as
 - the collective pollution generating potential thereof.

Mine stockpiles as listed in Table 3 include the following:

- Waste rock stockpiling;
- ROM stockpiling;
- Temporary topsoil storage/and removal;
- Overburden stockpiles; and
- Tailings Storage and stockpiling facilities.

The layout of the existing and proposed infrastructure, relating to the mining activities, was also based on the location of watercourses in the vicinity of the mining area. The existing infrastructure on site is located, as far as possible, 100 m from the watercourses and the layout of the proposed infrastructure will also be located outside the 100 m buffer, where feasible.

Table 5: Mine Infrastructure Arrangement Selection

Aspect	Description
Proposed project site.	In generating alternatives, consideration was given to available space, topography and the location of sensitive receptors and environmental features.
Undermining	No undermining of residential areas will take place. Due to the depth of the underground mining activities no impacts to environmental features is expected.
Material transport and process flow	Waste rock: Material will be transported by truck, close proximity to the opencast and to cater for the waste rock that will be generated as part of the opencast footprint.
Soils	Dumps and infrastructure to be placed on soils with the least agricultural potential, as far as feasible.
Potential Dust nuisance to residence	Mining activities will be placed as far as possible from any residences.



Aspect	Description
Potential for contamination of surface water.	All waste facilities and mine infrastructure will be located at least 100 m from any streams, or outside the 1:50 year flood lines of any water course as far as possible. Although, the development of a new opencast pit across various watercourses to access the chromitite on the Mining Right area is proposed as part of the application, which will be included and managed according to the WUL issued for the project.
Geology and fracture/fault intensity	Waste disposal sites and to the extent practically possible, the mine infrastructure, should be not be located on any major aquifer.
Potential exposure to spills and seepage	Facilities that could release contaminants to the groundwater should as far as practically possible be sited away from major fractures or surface water resources.
Safety	Safety considerations include haul road distances.
Integration with the process	The layout of the infrastructure and waste facilities must be suitable to the process flow.
Relative Pollution potential of each facility	The relative pollution potential of each waste type and the plant were considered in assessing the relative risk posed by waste material to surface and groundwater contamination.
Potential ecological harm due to spill	Facilities that could release contaminants to the groundwater should as far as practically possible be sited away from major fractures or surface water resources.
Visual intrusion	No feasible alternatives were identified for this impact.

7.2.2 Storm water Management and PCD's Layout

Storm water infrastructure will need to be constructed to cater for the proposed mining area. Pollution control dams (PCD) will be required for the storage of contaminated water originating from the mining activities. Water contained within the PCD will be utilised for dust suppression. The PCD will be designed by an engineer as part of the Storm Water Management Plan and should be lined and constructed in accordance with the Department of Water and Sanitations Best Practice Guidelines. The proposed storm water management infrastructure will be placed so as to ensure compliance with GN704 to separate clean and dirty storm water thus no alternatives were investigated and the final layout plan as proposed by the Engineers will be constructed.

7.2.3 Site Alternatives and requirements for a Tailings Dam

No Tailings dam design or construction form part of the project as mentioned under Section 3.2. The residue material from the wash plant will be allowed to dry on cement slabs, where after it will be stockpiled, thus no tailings dam will be constructed for the project. Therefore, no site selection alternatives will be applicable for a possible tailings facility. The wet tailings area and the dry residue stockpile will be located next to the plant where the process flow will be optimal.

7.3 Activity Alternatives

Due to limited water, the disposal of dry residue material was investigated and would reduce the water management requirements substantially. This may however impact on their process water balance as they may need more raw water for the use of in the wash plant if they allow the wet tailings material to dry. The water from this may be best suited to be captured and re-utilised in their process before disposing to the dry residue stockpile.

An alternative to the mining currently taking place is grazing and wilderness, specifically of community cattle. This will sterilise the resource and reduce potential income in the area in terms of salaries and the GDP for the economy and thus is not the preferred activity.

7.4 Process Alternatives

Options pertaining to the alternatives with regards to the processes to be used on site will be evaluated in more details



and the options will be taken into consideration to ensure the most efficient ore extraction and processing methods are used. Various options will also be investigated pertaining to the proposed infrastructure which will be required for the proposed mining operations in determining that the correct and most viable process alternatives are acquired.

7.5 No Go Option

The no-go option refers to the alternative of the proposed development not going ahead at all. This alternative will avoid potentially positive and negative impacts on the environment and the status quo of the area would remain. The implications of the no-go option will be evaluated as part of the EIA, focusing on comparing potential impacts from the proposed project with the status quo and will be particularly relevant should it be found that detrimental impacts cannot be managed to an acceptable level.



8 DETAILS OF THE PUBLIC PARTICIPATION PROCESS FOLLOWED

Red Kite Environmental Solutions conducted the public participation activities in such a way to involve the necessary I&APs.

Refer to Appendix 5 for full details of the Public Participation Process undertaken to date.

The following groups were identified as potential Interested and Affected Parties (I&APs):

- Community Representatives and Members;
- Relevant Government Departments;
- Relevant Institutional/Organisational Representatives;
- Relevant Municipal Representatives, including the relevant Ward Councillors;
- Landowners/Occupiers;
- Directly affected Surrounding Landowners/Occupiers;
- Land Claimants; and
- Non-Government Organisations and Agencies.

It should be noted that following the project initiation period no further public advertisements (i.e. in newspapers) will be undertaken. Accordingly, to ensure that all potential I&APs are made aware of the project and have the opportunity to register, the notification process will be as thorough as possible. Registration will remain open throughout the Public Participation Process, so as to allow affected parties to register and submit their input throughout. For the list of identified I&APs refer to Appendix 1 of the PP Report.

8.1 Newspaper Advertisements

To inform a broad base of individuals who might want to register as I&APs, newspaper advertisements will be placed in one local newspaper and one regional newspaper. For the advertisements which has been placed, refer to Appendix 3 of the PP Report.

Advertisements will appear in the following newspapers:

- Wednesday, 16 September 2020: The Citizen (Regional), published in English.
- Wednesday, 16 September 2020: The Weekend Review (Local), published in Sepedi.

8.2 Site Notices

To inform surrounding and immediate communities, landowners, mine workers and passers-by of the proposed project, at least twelve A2 notices will be erected at visible and accessible localities throughout the study area. These will be erected at, at least, six points in pairs consisting of one English Notice and one Sepedi Notice. Photographic evidence of the site notices to be erected on 16 September 2020 will be attached to the Final Scoping Report and succeeding reports for submission to the relevant Departments. Refer to Appendix 2 of the PP Report for the Site Notices to be erected.

8.3 Written Notifications

Identified I&APs will be directly informed of the application processes and availability of the reports for Public Commenting by means of email and hand delivery, as well as by Text Message (SMS). Proof of written notifications sent will be provided in the Final Scoping Report and succeeding reports for submission to the relevant Departments.



8.4 Notification of I&APs of Reports Availability

Potential I&APs will be informed of the availability of the Draft Scoping Report for Public Commenting on 15 September 2020 and 16 September 2020. I&APs will be encouraged to submit any comments or questions on or before the relevant commenting closing date (19 October 2020). Notifications will be sent by means of advertisements, site notices, hand delivery, email and text message (SMS). It will be indicated that hard copies of the document listed above for public commenting will be available at the Mphahlele Community Development Trust and at the Mphahlele Royal Council. Acknowledgement of receipt for the hand delivered documents for Public Commenting will be attached to the Final Scoping Report and succeeding reports for submission to the relevant Departments. Further to the hard copies left at the relevant Community Representatives a Dropbox link to an electronic copy will also be provided in email notifications, whereas all other notifications will specify that the link could be provided upon request from the Environmental Assessment Practitioner.

8.5 Registration and Draft Scoping Report

A 30-day commenting periods will be provided for as part of the Registration and Draft Scoping phase of this Public Participation Process. This will be conducted in line with Section 41(4)(ii) of the National Water Act (NWA), 1998 (Act No. 36 of 1998) which indicates that a commenting period of no less than 60 days should be provided for and in accordance with Clause 3(8) of the NEMA EIA Regulations (GN No. 326 of 07 April 2017) which indicates that any public participation process must be conducted for a period of at least 30 days . However, note that the entire process will remain transparent and allow for I&APs to register and comment throughout.

The local community will be taken into consideration by distributing hard copies of the relevant documents for Public Commenting to the Representatives for the Mphahlele Community Development Trust and the Mphahlele Royal Council. Furthermore, as mentioned earlier in this report a Dropbox link to an electronic copy will also be provided to ensure easy access to the documents available for public commenting.



9 ENVIRONMENTAL ATTRIBUTES ASSOCIATED WITH THE SITES

9.1 Baseline Environment

This Section provides a brief description of the existing biophysical and built/ social environment within the immediate vicinity of the proposed activities. It draws on existing knowledge from previous investigations, discussions with various role-players, site visits and the project team's knowledge. It serves to present the context against which the potential positive and negative impacts associated with the various aspects of the proposed project can be identified.

9.2 Regional Location

The proposed Mphahlele Mine is situated on the farm Locatie van M'phatlele 457 KS. The operation falls in the Limpopo Province under the jurisdiction of the Lepelle-Nkumpi Local Municipality, situated within the Capricorn District Municipality.

The Mining Right area is situated 60 km south-east of Mokopane and 50 km south of Polokwane. The towns / villages of Mphahlele, Phosiri, Dithabaneng and Mamaolo are located on the Mining Right area.

9.3 Climate

The study area is in the summer rainfall region, with arid winters and annual precipitation averages about 460 mm. When considering the dry northern parts of the Sekhukhune Plains Bushveld, the rainfall pattern is strongly influenced by the area's topography, varying from 416 mm in the east to 499 mm per annum in the west, and 522mm in the south to 478mm per annum in the north. Daily average temperatures range from a minimum of 8°C in winter to a maximum of 38°C in summer, with an average annual temperature of 20°C. Minimum temperatures of the below freezing point are extremely rare, even in the high-lying areas (Siebert et al. 2002).

Table 6: Average monthly precipitation (WR2012)

Month	Distribution % of MAP	Monthly Rain (mm)
Jan	17.7	84.3
Feb	14.3	68.0
Mar	11.2	53.1
Apr	6.15	29.2
May	2.07	9.8
June	1.01	4.8
July	0.75	3.6
August	0.87	4.1
September	2.67	12.7
October	8.63	41.0
November	17.1	81.3
December	17.5	83.1
Total (MAP)	100.0	475

Symons pan (S-Pan) evaporation data is based on the Water Research Council 2012 derived Mean annual Evaporation for quaternary catchment B52A of 1900mm and the monthly distribution of the MAE for the evaporation zone 1A. S-Pan evaporation was converted to open water evaporation using evaporation coefficients from WR1990.



Table 7: Average monthly evaporation

Month	S-Pan Evaporation (mm)	Conversion Factors	Lake Evaporation (mm)
January	195	0.84	164
February	167	0.9	147
March	164	0.9	145
April	132	0.9	116
May	114	0.87	100
June	92	0.85	78
July	102	0.83	85
August	139	0.81	113
September	180	0.81	145
October	211	0.81	171
November	199	0.82	163
December	203	0.83	169
Total	1900		1596

9.4 Topography

The Mining Right area is situated in an area characterised by rugged mountains and broad flat-bottomed valleys. There is a downward slope across the proposed project from west to east. The elevation on the western portion of the proposed project area is approximately 940 mamsl and the elevation at the banks of the Olifants River at the eastern portion of the proposed project area is approximately 740 mamsl. The area where the proposed mining activities will be located is relatively flat with a gentle undulating topography.

9.5 Geology

The farm is located in the very northern end of the eastern Bushveld Complex that is sub-divided into the western, central, and southern sectors. These sectors are separated by boundary areas, in which the Lower, Critical, and Main zones are either partially absent or structurally disturbed.

The Critical Zone, divided into Upper and Lower Zones, is characterized by rhythmic layering of cumulus chromite within a harzburgite, pyroxenite, norite and anorthosite sequence with a general upward reduction in mafic content. Chromitite layers formed at the bases of these cycles are categorized into three sections the Lower Group (LG), Middle Group (MG) and Upper Group (UG).

The Middle Group chromitites mark the boundary between the Upper and Lower Critical Zones. Seven LG chromitites (LG1 to LG7), four MG chromitites (MG1 to MG4) and two UG chromitites (UG1 to UG2) can be found with varying degrees of lateral variation around the Bushveld Complex.

The Western Sector of the Eastern Limb lies to the west of the Wonderkop fault and the Critical Zone trends east west and dips increase to 51deg at M'Phatlele Locatie 457KS becoming near vertical some 20km further to the west.

The most economically exploitable chromitite is LG6, which varies in thickness across the eastern Bushveld Complex from 0,92 to 2.5m. The MG2 consists of three distinct fine-granular chromitite layers with intercalated pyroxenite and is developed approximately 55m above the LG6 chromitite layer. The MG4 occurs as a composite package of approximately 3,5m.



9.6 Soil and land capability

The following information is sources from previous studies conducted in the area. A Soil and Land Capability Study will be undertaken for the Mphahlele Mine EIA process.

The dominant soil types expected within the proposed project area comprised of well drained red apedal and yellow-brown apedal loamy sands. The soil forms can typically be classified as Hutton (Hu) and Clovelly (Cv). The Hutton soil form dominates most of the area, with Clovelly soil forms typically found towards the bank of the Olifants River.

Both the Hutton and Clovelly soil forms have low-moderate erosion susceptibility, except around where these soils occur along the drainage lines and/or the river, where they are more prone to erosion.

Deep Hu1 soils are classified as moderate agricultural potential soils, whereas the shallow Hu2 soil forms which may be associated with the ridges on-site, as well as some Cv soils towards the bank of the Olifants River, are expected to have low agricultural potential.

Although the majority of the soils as well as the terrain within the proposed project area are likely suitable for agriculture, seasonal soil water availability is the most limiting factor to arable agriculture in this area. The agricultural potential may therefore be classified as moderate, primarily attributable to climatic constraints. Furthermore, shallow rooting depth, and high erosion risk may further reduce the agricultural potential for Hu2 and some Cv soils.

As mentioned above the majority of the proposed project area is expected to be moderately suitable for agricultural land use, although management practices would require considerable improvement in order to sustain longevity of agricultural practices on the land. For instance, cultivation for crop production would require installation of an irrigation system to meet crop water demands and produce sustained crop yields. These soils are also well suited to other less intensive agricultural land uses such as cultivated pastures, natural grazing, and wildlife.

9.7 Surface Water

The proposed mining area falls within the Olifants Water Management Area, specifically the Middle Olifants management area, which is lately being characterised by a large number of platinum and chrome mines being developed. The mines have increased the water requirements in the area both due to their direct industrial water use and increased potable use caused by influx of people. Based on the water balance reconciliation study performed by the former Department of Water Affairs and Forestry it was predicted that the water deficit of 241 million m³/a will grow to 279 million m³/a by the year 2025. These figures highlight the shortage of water in this Water Management Area which is classed as severely stressed.

The Mining Right area is located in the B52D quaternary catchment. Various non-perennial drainage lines are located on the project area. The perennial Chunies River flows through the southern end of the proposed mining footprint.

Runoff from the site will drain toward the Chunies River and from there the Olifants River, which flows along the eastern border of the Mining Right area.



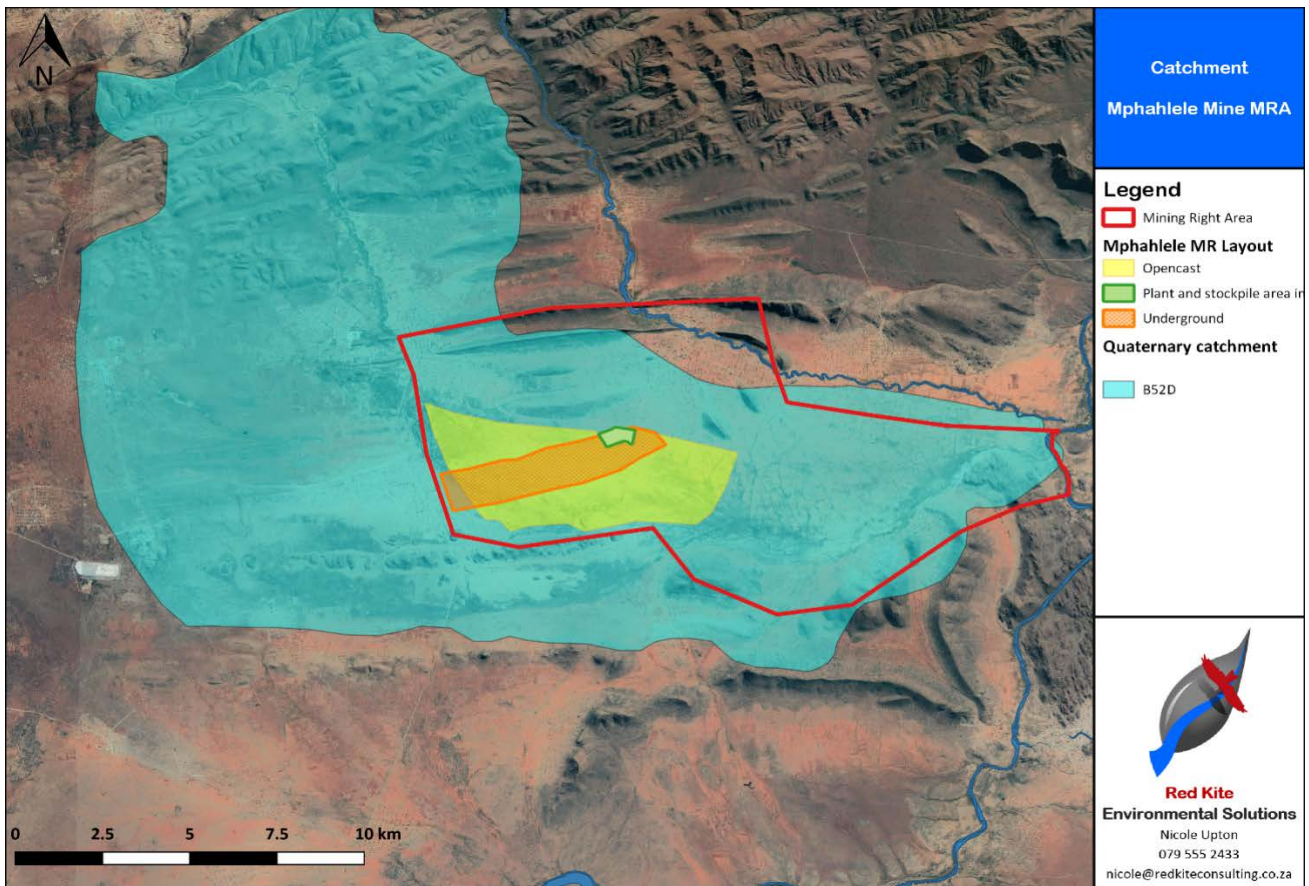


Figure 6: Catchment

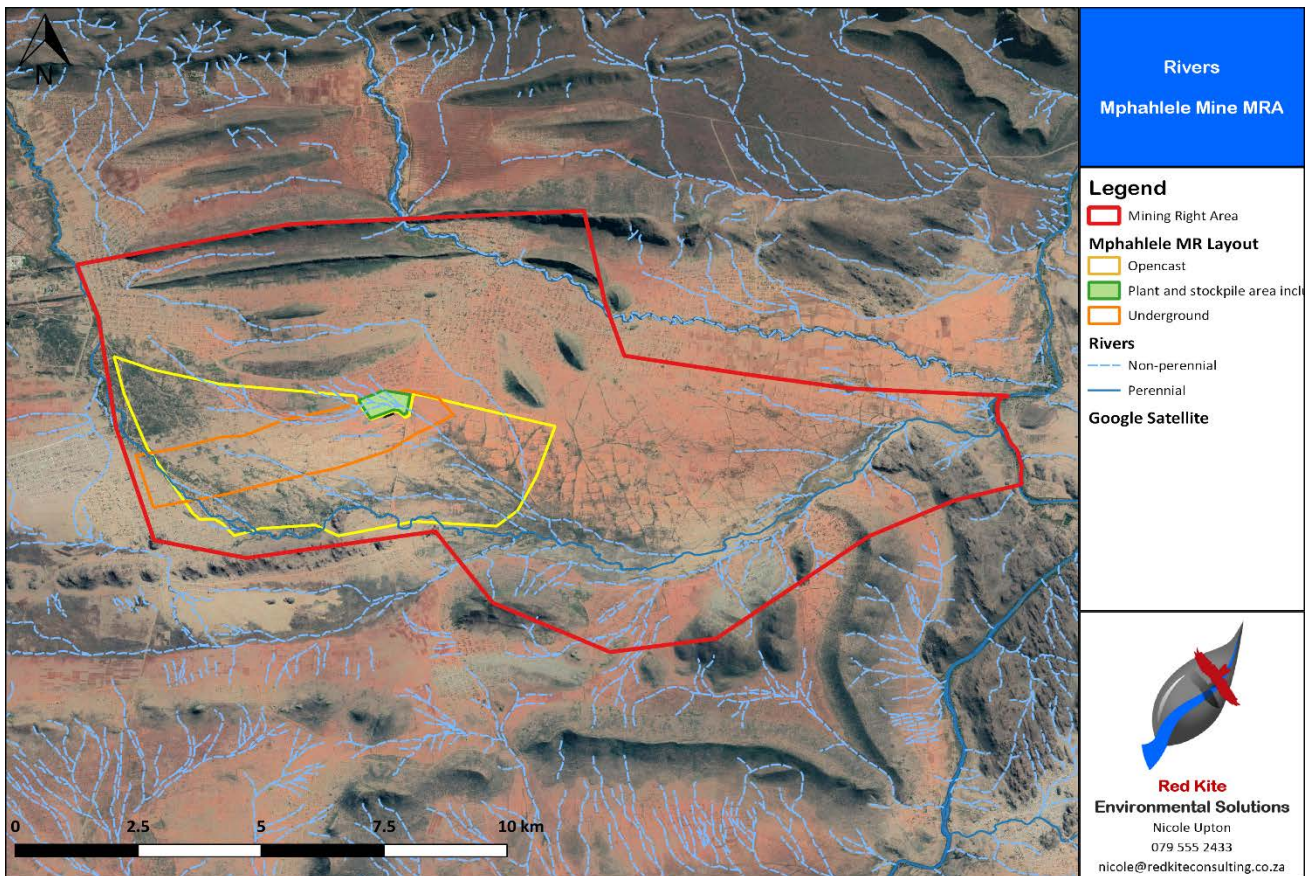


Figure 7: Rivers in the vicinity of the project site



9.8 Wetlands

According to the SANBI GIS database, the only wetland within the proposed project area is the wetland associated with the riparian zone of the Olifants River. However, the initial site visit is expected that no wetland features are associated with the floodplain of the Olifants River within the proposed project area, with the floodplain instead being regarded as an alluvial floodplain. Considering the broader project area, no wetlands were identified.

A wetland specialist assessment will be conducted as part the Scoping and EIA process for the project.

9.9 Groundwater

Four aquifers occur in the area. These four aquifers are associated with the alluvial aquifer material, the underlying shallow weathered fractured rock material, the upper weathered fractured rock aquifer and the deeper, more competent, less weathered, fractured rock. These four aquifers are detailed in the paragraphs below.

Alluvial Aquifer

The alluvial aquifer is composed of unconsolidated layers of sand and silt deposits. The aquifer is unconfined and laterally discontinuous, localised within the immediate vicinity of the riverbanks and the floodplains, and therefore does not extend regionally throughout the total proposed project area. These aquifers are usually fairly high yielding due to their interaction with the surface water bodies, coupled with the relatively high storage capacity of the unconsolidated sediments. The interaction between the alluvial aquifer and the river depends on the differences between the surface water and groundwater levels and the presence or absence of an impervious streambed which would affect the hydraulic connection.

Shallow Weathered Material Aquifer

The shallow aquifer forms due to the norite which weathers preferentially along bands of magnetite, bronzitite and anorthosite to form a variably permeable, fractured and porous rock mass from surface to depths of 8 m. Groundwater collecting above the weathered material contact migrates down gradient along the contact to lower lying areas. The average thickness of the topsoil and weathered material is approximately 5 to 9 m. It is considered that effectively 1 to 3 % of the mean annual rainfall eventually reaches the groundwater table. Aquifer transmissivities are in the order of 0.8 to 1.5 m²/day.

Upper Weathered Fractured Rock Aquifer

The average thickness of the upper weathered zone is calculated to range between 11 and 20 m. Groundwater flows in the lower aquifer are associated with the secondary fracturing in the slightly weathered rock that was formed by the major north / south striking faulting seen from the geological maps and confirmed by the ground geophysical survey. Groundwater flows and contaminant transport will be along discrete pathways associated with the fractures. T

Lower Fractured Rock Aquifer

The lower fractured rock aquifer is associated with the competent fractured rock below 25 m where there is little indication of weathering. Recharge is from the upper fractured rock aquifer through discrete fractures and faults. Transmissivities are considered to range between 0.1 to 0.8 m²/day. The average depth of this layer is expected to be approximately 80 m where the weight of the overlying rocks will close the fractures.

Groundwater is not the sole source of water supply to the local landowners as the municipality supplies water services to the area. The groundwater usage in the area is expected to be only for domestic supply.



9.10 Terrestrial Ecology

9.10.1 Flora

The proposed project area is situated within the Savanna Biome which is characterised by a grassy ground layer and a distinct upper layer of woody plants. Only one vegetation type, Sekhukhune Plains Bushveld occurs in the proposed project area.

Sekhukhune Plains Bushveld consists mainly of semi-arid plains and open valleys between hills and small mountains running parallel to the escarpment. Important taxa in this vegetation type includes the nationally protected trees, *Acacia erioloba*, *Combretum imberbe* and *Philenoptera violacea* as well as smaller trees such as *Acacia mellifera* subsp. *detinens*, *A. nilotica*, *A. tortilis* subsp. *heteracantha*, *Commiphora glandulosa*, *Ptaeroxylon obliquum* and *Ziziphus mucronata*. The area is rich in succulent diversity and includes species such as *Euphorbia tirucalli*, *Aloe cryptopoda*, *Euphorbia enormis*, *Kleinia longiflora*, *Aloe castanea*, *A. globuligemma* while the grass layer includes species such as *Cenchrus ciliaris*, *Enneapogon cenchroides*, *Panicum maximum*, *Urochloa mosambicensis*, *Aristida adscensionis* and *Tragus beteronianus*. Erosion is widespread associated with this vegetation type and there is a high risk of donga formation while extensive infestation by alien species such as *Agave*, *Caesalpinia decapetala*, *Lantana camara*, *Melia azedarach* and various *Opuntia* species is present.

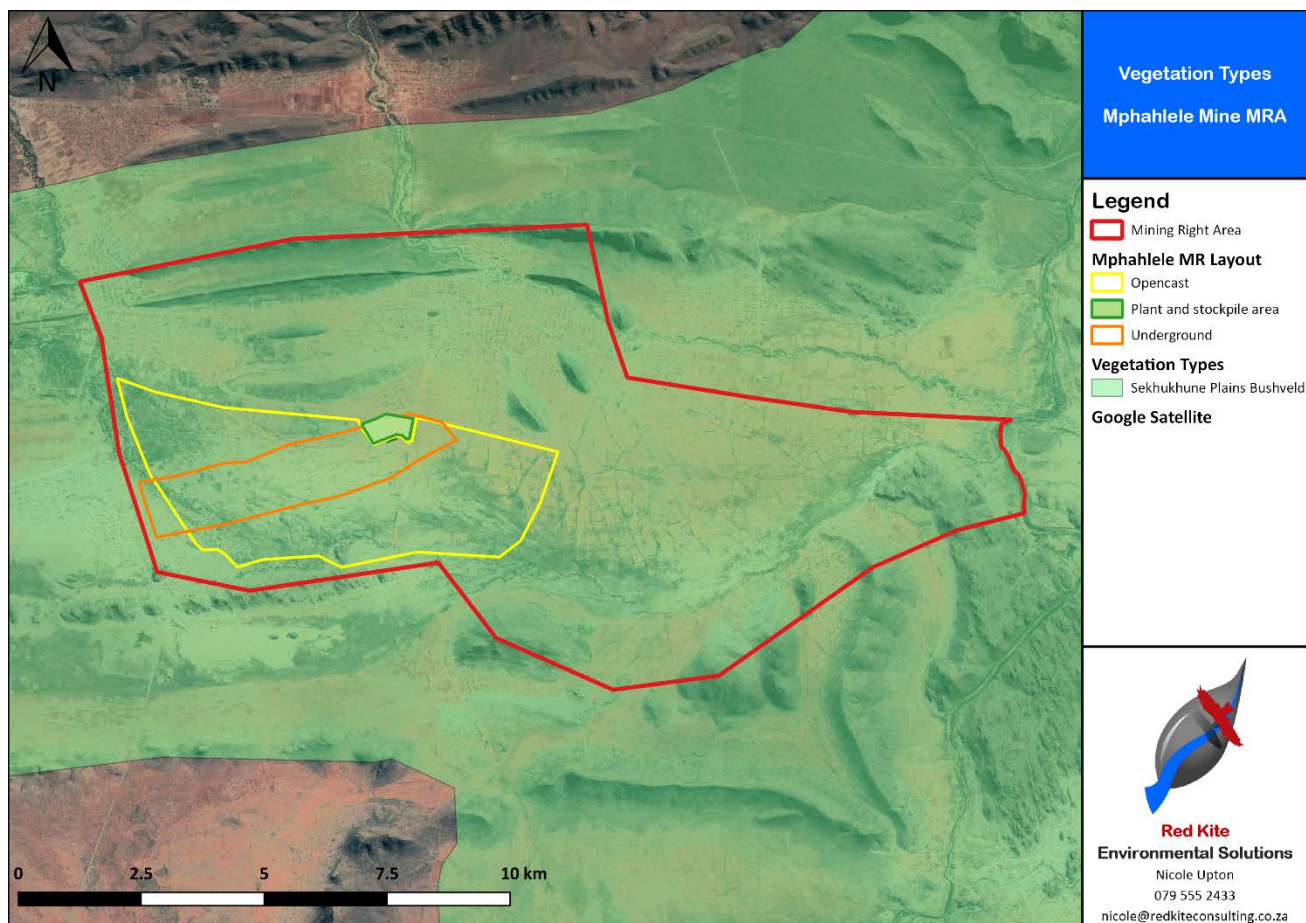


Figure 8: Vegetation Type occurring on the project area

The proposed project area falls in the Sekhukhuneland centre of endemism. There are at least 30 endemic plant taxa in the Sekhukhuneland centre of endemism.

The proposed project area supports a variety of vegetation communities which included rocky outcrops, Acacia-dominated plains, and riparian areas and drainage lines.

Plants of conservation concern

A minimum of ten plant species of conservation concern could occur within the proposed project area. These species including habitat requirements and likelihood of occurrence in the proposed project area is listed in the table below.

Table 8: Plant species of conservation concern which may occur within the proposed project area

Species	Conservation status
<i>Adenia fruticosa</i>	Near threatened
<i>Aneilema longirrhizum</i>	Near threatened
<i>Asparagus sekhukhuniensis</i>	Endangered
<i>Boophone disticha</i>	Declining
<i>Crinum stuhlmanii</i>	Declining
<i>Euphorbia sekhukhuniensis</i>	Rare
<i>Lydenburgia cassinoides</i>	Near threatened
<i>Plectranthus porcatus</i>	Vulnerable
<i>Plectranthus venteri</i>	Rare
<i>Searsia sekhukhuniensis</i>	Rare

Provincially protected plant species

Five species that were identified within the proposed project area during the assessment are not threatened but are protected under Schedule 11 of the Limpopo Environmental Management Act (Act No.7 of 2003).

Table 9: Provincially protected plants which may occur on the proposed project area

Species	Protection level
<i>Aloe cryptopoda</i> (<i>A. wickensii</i>)	Species
<i>Huernia</i> spp.	Genus
Orchidaceae	Genus
<i>Spirostachys africana</i>	Species
<i>Stapelia</i> spp.	Genus

Nationally protected tree species

Four protected tree species, in terms of the National Forest Act, 1998 (No. 84 of 1998), *Combretum imberbe* (Leadwood), *Philenoptera violaceae* (Apple Leaf), *Sclerocarya birrea* (Marula) and *Balanites maughamii* (Green Thorn).

9.10.2 Fauna

Mammals

The region displays a high diversity of mammals with approximately 117 species expected to occur within the Quarter Degree Square (QDS). None of the mammal species that are highly likely to be present are of conservation concern (i.e. with a status higher than Least Concern).



Table 10: Mammal species which are highly likely to occur in the proposed project area.

Species	Conservation status
<i>Acomys spinosissimus</i> (Spiny Mouse)	Least concern
<i>Aethomys ineptus</i> (Tete Veld Rat)	Least concern
<i>Canis mesomelas</i> (Black-backed Jackal)	Least concern
<i>Civettictis civetta</i> (African Civet)	Least concern
<i>Galago moholi</i> (Southern Lesser Galago)	Least concern
<i>Lepus saxatilis</i> (Scrub Hare)	Least concern
<i>Mus musculus</i> (House Mouse)	Least concern
<i>Neoromicia capensis</i> (Cape Serotine)	Least concern
<i>Neoromicia zuluensis</i> (Zulu Serotine)	Least concern
<i>Rattus rattus</i> (Black Rat)	Least concern

Avifauna

The area is high in avifaunal diversity with approximately 441 bird species expected to occur within the QDS. At least six species of conservation concern are likely to use the proposed project area for foraging or nesting. These species are listed in the table below.

Table 11: Avifaunal SCC that may occur on the project site

Species	Conservation status
<i>Vanellus albiceps</i> (White-crowned Lapwing)	Near threatened
<i>Aquila rapax</i> (Tawny Eagle)	Vulnerable
<i>Polemaetus bellicosus</i> (Martial Eagle)	Vulnerable
<i>Sagittarius serpentarius</i> (Secretary bird)	Vulnerable
<i>Falco biarmicus</i> (Lanner Falcon)	Near threatened
<i>Buphagus erythrorhynchus</i> (Red-billed Oxpecker)	Near threatened

Reptiles

Fourteen reptile species are expected to occur within the QDS, none of which are of conservation concern as their conservation status has not yet been evaluated. These species are listed in the table below.

Table 12: Reptile species which may occur in the proposed project area

Species	Conservation status
<i>Agama atra</i> (Southern Rock Agama)	Not evaluated
<i>Cordylus vittifer</i> (Common Girdled Lizard)	Not evaluated
<i>Heliobolus lugubris</i> (Bushveld Lizard)	Not evaluated
<i>Lygodactylus nigropunctatus</i> subsp. <i>igropunctatus</i> (Black-spotted Dwarf Gecko)	Not evaluated
<i>Nucras holubi</i> (Holub's Sandveld Lizard)	Not evaluated
<i>Pedioplanis lineocellata</i> subsp. <i>lineocellata</i> (Spotted Sand Lizard)	Not evaluated
<i>Philothamnus semivariatus</i> (Spotted Bush Snake)	Not evaluated
<i>Platysaurus orientalis</i> subsp. <i>Fitzsimonsi</i> (FitzSimons' Flat Lizard)	Not evaluated
<i>Platysaurus orientalis</i> subsp. <i>orientalis</i> (Sekhukhune Flat Lizard)	Not evaluated
<i>Psammobates oculifer</i> (Serrated Tent Tortoise)	Not evaluated
<i>Smaug (Cordylus) vandami</i> (Van Dam's Girdled Lizard)	Not evaluated
<i>Trachylepis margaritifer</i> (Rainbow Skink)	Not evaluated
<i>Trachylepis varia</i> (Variable Skink)	Not evaluated
<i>Varanus albigularis</i> subsp. <i>albigularis</i> (Rock Monitor)	Not evaluated



Amphibians

There are eight amphibian species expected to occur within QDS, which are listed in the table below.

Table 13: Amphibian species which may occur in the proposed project area

Species	Conservation status
<i>Breviceps adspersus</i> subsp. <i>Adspersus</i> (Bushveld Rain Frog)	Least concern
<i>Amietophrynus garmani</i> (Eastern Olive Toad)	Least concern
<i>Amietophrynus gutturalis</i> (Guttural Toad)	Least concern
<i>Hyperolius marmoratus</i> (Painted Reed Frog)	Least concern
<i>Kassina senegalensis</i> (<i>Bubbling Kassina</i>)	Least concern
<i>Ptychadena anchietae</i> (<i>Plain Grass Frog</i>)	Least concern
<i>Tomopterna cryptotis</i> (<i>Tremolo Sand Frog</i>)	Least concern
<i>Tomopterna natalensis</i> (<i>Natal Sand Frog</i>)	Least concern

Invertebrates

Lepidoptera species have been recorded in Limpopo Province of which nine species are of conservation concern namely *Telchinia induna salmontana*, *Dingana clara*, *Dingana jerinae*, *Pseudonympha swanepoeli*, *Alaena margaritacea*, *Aloeides stenvensoni*, *Anthene juanita*, *Erikssonia acraeina*. Although these species may occur within the proposed project area, it is considered unlikely.

Four genera in the Theraphosidae family namely *Ceratogyrus darlingi*, *Harpactira gigas*, *Idiothele nigrofulva* and *Pterinochilus lugardi* are also likely to occur in the proposed project area and the first three species mentioned are provincially or nationally protected.

9.11 Air Quality

No ambient air quality data exists for the proposed project area. The background concentrations/fallout for the area could therefore not be assessed. A specialist air quality assessment will be conducted during the assessment phase to detail the current sources of pollution and sensitive receptors surrounding the proposed project area.

The existing sources of pollution, detailed in the paragraphs that follow, in the vicinity of the proposed project area include:

- Emissions from various mining facilities;
- Vehicle emissions;
- Fuel burning;
- Crop residue burning and veld fires; and
- Fugitive dust.

Fugitive emissions from quarrying and mining operations mainly comprise of land clearing operations (i.e. scraping, dozing, and excavating), materials handling operations (i.e. tipping, off-loading and loading, conveyor transfer points), entrainment from vehicles on haul roads, wind erosion from open areas and drilling and blasting. These activities mainly result in fugitive dust releases with small amounts of oxides of nitrogen (NOx), carbon monoxide (CO), sulphur dioxide (SO₂), methane, carbon dioxide (CO₂) being released during blasting operations. Existing mining projects in the vicinity of the proposed project area include Atok, Twickenham, Marula, ASA and Maandagshoek.

Air pollution from vehicle emissions containing CO₂, CO, hydrocarbons, SO₂, NOx, particulates and lead is another source of pollution in the vicinity. The main road in the vicinity of the proposed project area is the R37. In addition, there are numerous smaller unpaved roads in the proximity of the proposed project area.



It is likely that certain households within local communities/settlements utilise wood or coal for space heating and/or cooking purposes. Pollutants arising due to wood burning include inhalable particulates, CO and SO₂ with trace amounts of polycyclic aromatic hydrocarbons. Coal burning emits a large amount of gaseous and particulate pollutants including SO₂, total and inhalable particulates including heavy metals and inorganic ash, CO, polycyclic aromatic hydrocarbons, NO₂ and various toxins.

Crop-residue burning and general wildfires (veld fires) represent significant sources of combustion-related emissions associated with agricultural areas, with carbon monoxide, methane and nitrogen dioxide being emitted during the process.

Fugitive dust emissions may occur as a result of vehicle entrained dust from local paved and unpaved roads, wind erosion from open areas and dust generated by agricultural activities (e.g. tilling) as well as mining.

9.12 Noise

A specialist noise assessment will be conducted during the assessment phase to detail the current ambient noise levels, the noise character of the proposed project area and the surrounding sensitive receptors.

The daytime ambient background noise levels are expected to be in line with the relevant SANS guideline as the limit for a rural area (being 45 dB(A)). The average nighttime ambient noise levels for the proposed project area are expected to also be in line with the relevant SANS guideline for a rural area.

9.13 Archaeology and Heritage

According to the Lepelle-Nkumpi Local Municipality Integrated Development Plan (IDP), large areas of land in the municipality (approximately 95% of the land) forms part of the former Lebowa homeland and is now held in trust for tribal and community authorities. These traditional authorities play a very important role in terms of their culture and have a major influence in the manner in which land is made available to individuals for settlement, as well as the use thereof for economic purposes (e.g. agriculture, tourism, etc.).

The Olifants River drainage system hosts a large number of archaeological sites, from the Earlier Stone Age to the Late Iron Age.

A Heritage Assessment will be undertaken for the project.

9.14 Socio Economic Conditions

The municipal area is pre-dominantly rural with a population of approximately 241 414 people and covers a surface area of approximately 3 455 km², which represents 20.4% of the District's total land area. The municipality is divided into 29 wards which comprises a total of 110 settlements. About 95% of its land falls under the jurisdiction of Traditional Authorities. The municipality has six Traditional Authorities namely Mathabatha, Seloane, Ledwaba, Moletlane, Mphahlele, and Mafefe. The proposed project area falls under the jurisdiction of the Mphahlele tribal authorities. Sepedi is the most spoken language with 85.9% of inhabitants speaking this language.

Statistics show that 49% of the Lepelle-Nkumpi population is under 19 years of age and 6% is elderly residents. These figures imply that the municipal area has a high dependency ratio as few people possess the ability to bring income into households. Within the economically active age group (15 – 64 years), Lepelle-Nkumpi has an unemployment rate of 15.5% and an employment rate of 21.4%. The number of economically inactive person(s) in the employable age groups



is significant as of 63.1% are not economically active. The reason for the difference in this rate is unclear, but this high rate puts a major strain on employed individuals.

The Municipality has a high number of functionally illiterate people with 20% having no schooling, 31% only attending school up to primary level, while 30% only attained secondary level. There is also a high rate of unemployment (43%) in the municipal area. The major employment sectors are community, social and personal services; wholesale and retail trade; manufacturing; construction; financial; insurance; real estate and business services as well as mining and quarrying. Lepelle-Nkumpi is the third largest contributor to the district Gross Geographic Product (GGP) at 13.6% and is the first largest contributor to mining, second largest in community services and third largest contributor in terms of construction. Facilities in the municipal area include: a total of 21 health facilities within the municipality (19 primary health care clinics and 3 hospitals), these facilities are supplemented by the operation of six mobile clinics; 116 primary schools, 81 secondary schools and 1 Further Education and Training College; four police stations and one magisterial court.

Currently 68% of households have access to water above the Reconstruction and Development Programme (RDP) standard, only 27% of households have sanitation facilities to RDP standard and all villages have access to the electricity grid, albeit with approximately 6927 households still requiring electricity connections. Approximately 24% of households in Lepelle-Nkumpi have access to a municipal solid waste disposal service (restricted to the urban areas of Lebowakgomo, Mathibela and Rakgoatha). Most people who reside within rural areas dig their own refuse dumps within their yards or on unoccupied land. Telkom’s public telephone service provides telecommunication network facilities to approximately 60% of villages in the municipal area. A small percentage of households (10%) do not have access to public telephone within a 500 m radius.

A Socio-economic Study will be undertaken as part of the EIA process for the project.

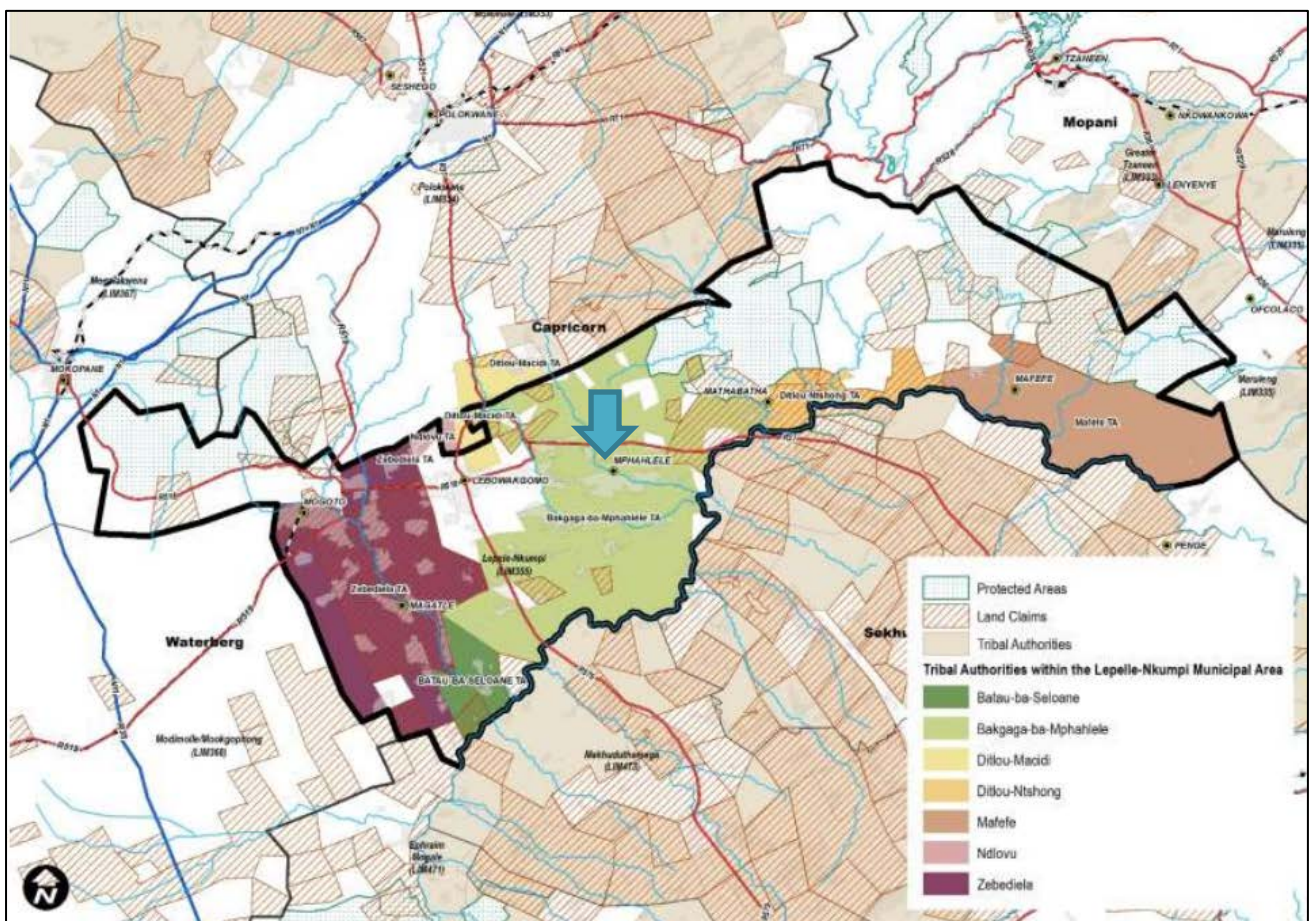


Figure 9: Traditional Authorities in the Local Municipality



9.15 Description of the Current Land Uses

The proposed Mphahlele Mine is situated on the farm Locatie van M'phatlele 457 KS. The operation falls in the Limpopo Province under the jurisdiction of the Lepelle-Nkumpi Local Municipality, situated within the Capricorn District Municipality. The towns / villages of Mphahlele, Phosiri, Dithabaneng and Mamaolo are located on the Mining Right area.

The proposed project area is characterised by a mix of land uses. Sections thereof comprise natural land currently used for the grazing of livestock and subsistence farming by local residents. Various dirt roads traverse the project area.

Current land uses in the area surrounding the proposed project area include livestock grazing, subsistence farming, and residential areas.

Grazing areas are generally regarded as communal and can be used by all members of the community. Over-grazing during dry periods has denuded much of the area and it is hence extremely susceptible to water and wind erosion.

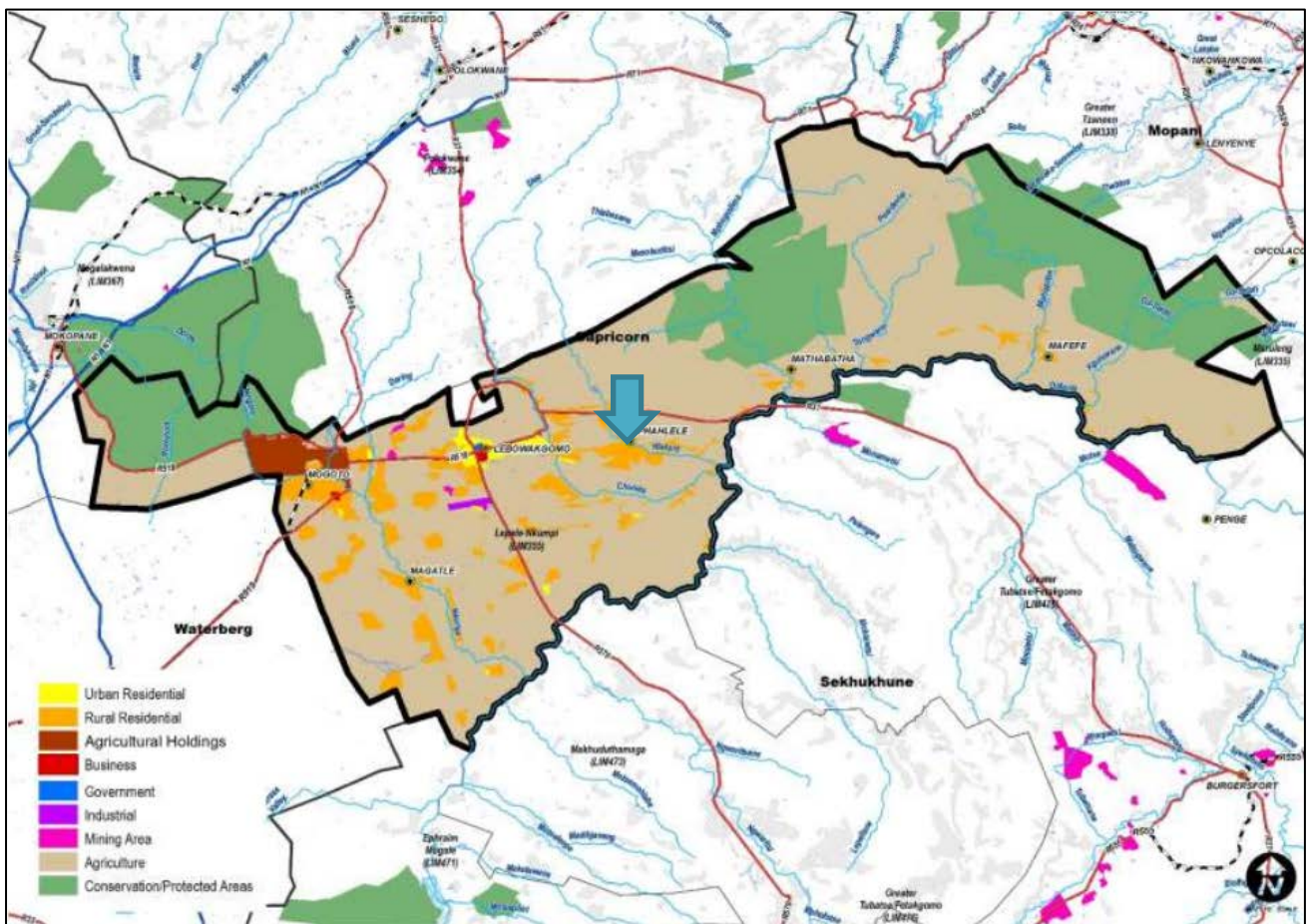


Figure 10: Land use in the Lepelle-Nkumpi LM

9.15.1 Sensitive landscapes

The occurrence of possible sensitive landscapes at the project site is outlined in the table below.

Table 14: Sensitive Landscapes within the Proposed Mining Site

Types of sensitive landscapes	Occurrence at the Proposed Mining Site
<p>Nature conservation or ecologically sensitive areas - indigenous plant communities (particularly rare communities and forests), wetlands, rivers, riverbanks, lakes, islands, lagoons, estuaries, reefs, inter-tidal zones, beaches and habitats of rare animal species.</p>	<p>This area forms part of the Sekhukhune Centre of Endemism which has a high level of biodiversity with some species that can only be found within certain areas along this Centre.</p> <p>No protected areas in terms of the NEMPAA are located within 10 km of the Mining Right area.</p> <p>The Sekhukhune Plains Bushveld vegetation type is listed as Least Concern in the NEMBA.</p> <p>No wetlands are located on the project footprint.</p> <p>The Olifants river is located along the eastern border of the Mining Right area. However, the project footprint is situated approximately 10 km from the Olifants River.</p> <p>The project footprint is situated across a section of the perennial Chunies River and various drainage lines. Watercourses are considered to be sensitive.</p> <p>The project footprint is located over areas classified as Ecological Support Areas in terms of the Limpopo Conservation Plan.</p>
<p>Sensitive physical environments - such as unstable soils and geo-technically unstable areas.</p>	<p>None</p>
<p>Important natural resources - river systems, groundwater systems, high potential agricultural land.</p>	<p>The Olifants river is located along the eastern border of the Mining Right area. However, the project footprint is situated approximately 10 km from the Olifants River.</p> <p>The project footprint is situated across a section of the perennial Chunies River and various drainage lines. Watercourses are considered to be sensitive.</p> <p>Aquifer characteristics and land capability studies will be undertaken.</p>
<p>Sites of special scientific interest</p>	<p>None</p>
<p>Sites of social significance - including sites of archaeological, historic, cultural, spiritual or religious importance and burial sites.</p>	<p>An Archaeological study will be undertaken as part of the EIA process. However, in consideration of the various communities located around the Mining Right area, sites of social significance are expected to occur.</p>



Types of sensitive landscapes	Occurrence at the Proposed Mining Site
Sites of outstanding natural beauty, panoramic views and scenic drives	A visual assessment will be undertaken as part of the EIA phase of het project.
Green belts or public open space in municipal areas	Not applicable.

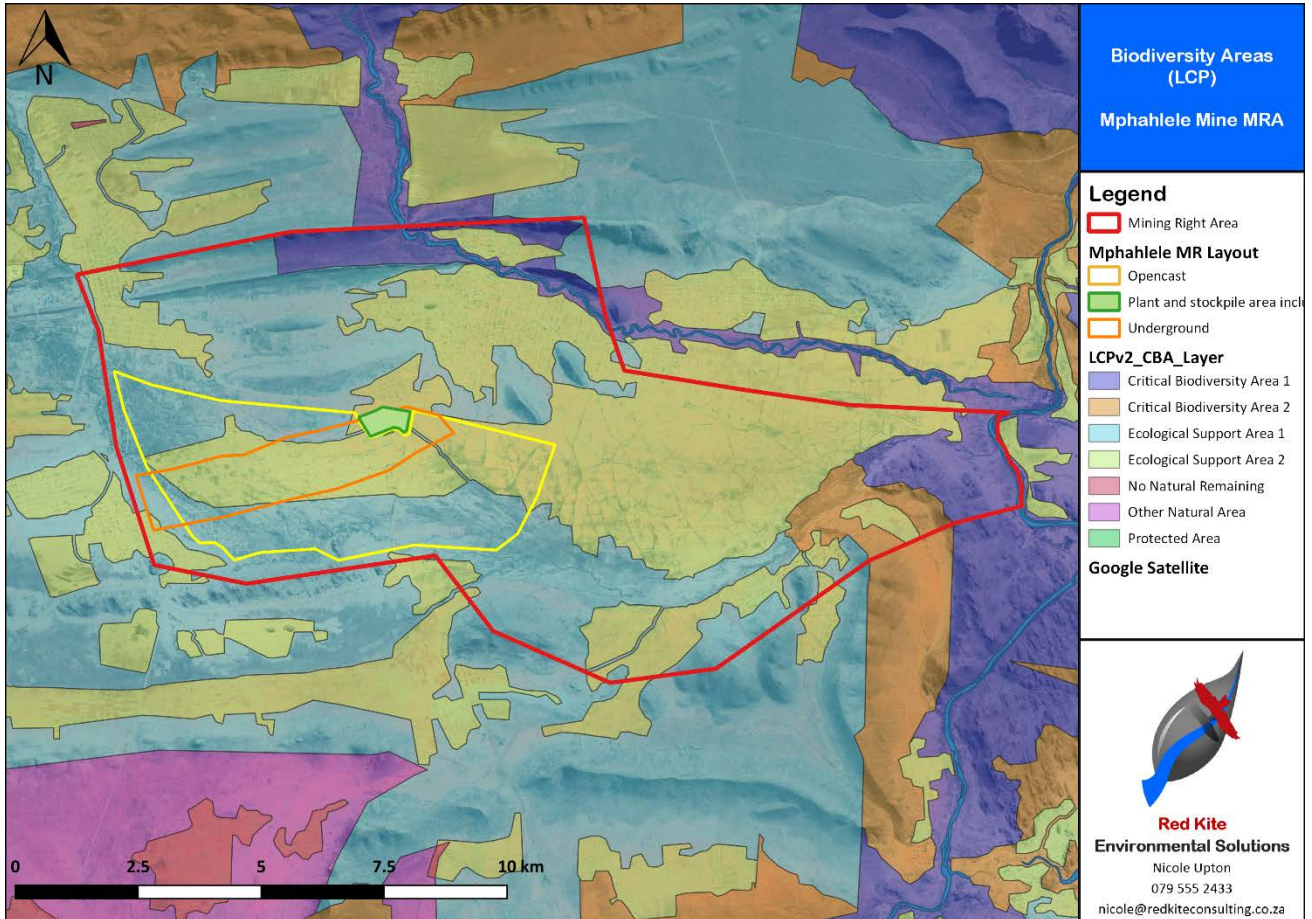


Figure 11: LCP Biodiversity areas occurring on the project site



10 IMPACTS AND RISKS IDENTIFIED INCLUDING THE NATURE, SIGNIFICANCE, CONSEQUENCE, EXTENT, DURATION AND PROBABILITY OF THE IMPACTS, INCLUDING THE DEGREE TO WHICH THESE IMPACTS CAN BE MANAGED

10.1 Impacts Identified

The Proposed Project may cause impacts to the immediate, surrounding and regional cultural, biophysical and socio-economic environment. Specific cultural, environmental and socio-economic impacts are anticipated to occur at different phases of the project during the life of mine. These phases include:

- Construction
 - Including the planning and implementation phases, construction of associated infrastructure, development of opencast area, access ramps and roads, haul roads, waste facilities (mineral and non-mineral), mine residue stockpiles, product stockpiles, handling areas, and ore processing facilities.
- Operation
 - Including general mining activities, ore transportation, mine development, storage of waste material (including mine residues) and expansion as well as processing of ore.
- Decommissioning
 - Including scaling down of activities ahead of temporary or permanent closure, cessation of mining production and associated ore processing, implementation of rehabilitation programme, monitoring and maintenance for prescribed period after cessation of operations.
- Closure
 - Including completion of rehabilitation goals, application for closure, transfer of liability to the State and agreed post-closure monitoring and maintenance.

The impacts associated with each of these phases will be specific to the mineral commodity, cultural, environmental and socio-economic context, mining method, spatial and temporal aspects of the operation and stated rehabilitation goals. For the purpose of this report, anticipated/ potential impacts have been identified, although this was determined from a desktop approach. This approach also took into consideration typical impacts previously identified from similar projects within the area. Specific cultural, environmental and socio-economic impacts associated with the Proposed Project will be assessed and quantified during the EIA Phase of the project. The methodology that will be utilised is detailed in **Section 10** of this report.

Please note that the significance, probability and duration of the anticipated impacts will need to be quantified during the EIA Phase of the project and as such, have not been included herein.

The following cultural, environmental and socio-economic impacts associated with the Proposed Project have been assessed in this document. The impacts include all aspects of the mining, processing and associated activities during the construction, operation, decommissioning and post-closer phases.

- Geology;
- Topography;
- Climate;
- Air quality;
- Soil, land use and land capability;
- Biodiversity;
- Hydrology and geohydrology;
- Noise;
- Traffic;
- Visual aspects;



- Sites of archaeological, historic or cultural interest;
- Socio-economic aspects; and
- Mine closure.

Anticipated impacts associated with the Proposed Project are included in the table below.

Table 15: Anticipated Impacts associated with the Proposed Project

Environment	Anticipated Impact (excluding mitigation)
Geology	<ul style="list-style-type: none"> • The Proposed Project may have an impact on the rock masses that influence the groundwater and topography on the project site, and may impact post-mining slope stability. • Excavation of rock and ore for the opencast pit and underground mining will influence the underlying geology of the site as a void will be created, that may have a steep gradient or stepped highwalls. • Resultant impacts from blasting and vibrations may impact on geology. Drilling and blasting may cause unintended collapse of underground workings. • The extraction of ore and waste rock from the opencast mines will result in the permanent removal of geology/ lithology. • Apart from specific rock types or outcrops which are of scientific interest or cultural significance, the direct impact of mining on geology is seldom highly significant unless the long-term effects on groundwater or topography have important ramifications. • Disturbance and removal of the geological strata due to excavation and subsequent removal of the reef.
Topography	<ul style="list-style-type: none"> • Disturbance of topography as a result of the opencast pits, stockpiling of stripped topsoil for the associated mining infrastructure, stockpiling of tailings material, overburden and waste rock. • Potential aesthetic impact resulting from the opencast pit, processing plant and activities, waste rock dump and tailing storage facilities, soil and product stockpiles and mine infrastructure. • Site clearing and topsoil removal and establishment of mining infrastructure and access as well as the clearing of vegetation and topsoil associated with the surface laydown area.
Climate	<ul style="list-style-type: none"> • Regional and local rainfall and wind characteristics should not be affected by activities associated with the Proposed Project. • Local atmospheric conditions (i.e. temperature) within the immediate area could be affected due to the increase of equipment, machinery and vehicles as well as processing activities potentially affecting the local lower regions of the troposphere above the project site. • An increase in greenhouse gas emissions associated with increase burning of fossil fuels for vehicles, machinery and equipment as well as activities associated with the mining and processing is anticipated. • Resultant decrease in non-renewable fuel sources in the area resulting with the increase fuel requirements associated with the Proposed Project.
Air Quality	<ul style="list-style-type: none"> • The generation of fugitive dust and particulate matter (PM) from the construction, operational and closure phases of the Proposed Project is anticipated (land clearing, drilling and blasting, transportation of ore via road and conveyor, crushing, processing activities, stockpiling waste rock and tailings material, soil and ore, etc.). <ul style="list-style-type: none"> – Dust may impact on the health and safety of employees and the surrounding community through respiratory, visual and aesthetic impacts. – Dust may contain toxic metals and may have direct on the community and fauna in the area. – Dust fallout retards vegetation growth and reduces the palatability of plants to animals.



Environment	Anticipated Impact (excluding mitigation)
	<ul style="list-style-type: none"> • Drilling, blasting and abrasion of hard rock overburden may generate dust. • Vehicle activity associated with mining may generate dust. • Topsoil and overburden removal and stockpiling, drilling and blasting, deposition of waste rock and tailings material may contribute to the generation of dust. • Crushing activities within the concentrator may have the potential to contribute to the generation of dust and PM. • Use of vehicles, equipment and machinery could result in the release of volatile organic compounds (VOCs) associated with burning of fossil fuels.
Soils, land use and land capability	<ul style="list-style-type: none"> • Excavation and soil stockpiling during site preparation may result in the dilution of highly fertile organic components within the soil and may result in the loss of topsoil on the site. • Excavation and soil stockpiling during site preparation may result in the ingress of alien invasive plant species to the area, impacting on the future sustainable land use potential and land capability after mining. • Development of the opencast pits may result in the dilution of highly fertile organic components within the soil and may result in the loss of topsoil on the site. This may also result in the ingress of alien invasive plant species to the area, impacting on the future sustainable land use potential and land capability after mining. • Transport network construction, excavation and associated mining activities have the potential to compact topsoil which can cause an increase of sheet-water runoff resulting in erosion (e.g. storm water runoff). This results in a loss of fertile topsoil resources and increase particulate solids in runoff that could impact on surrounding surface water bodies. • The compaction of soil may also concentrate surface water runoff from the site, resulting in downstream erosion, flooding or loss of biodiversity. • Leachate from waste rock dumps, ROM stockpile and the storage of tailings material may contaminate soils from infiltration, resulting in surface and groundwater contamination. • Soil contamination may occur from spillages and leakages of hydrocarbons, contaminated water, wash plant runoff, etc. onsite. • Contamination from the poor management of wastes generated onsite may impact negatively on the soil of the area, resulting in a decrease of land use and resultant land capability. • Potential loss of grazing capacity and cultivated agriculture (land use) as a result of mining and associated activities. • Potential acid mine drainage from waste rock dumps and tailings storage facilities could result in acidic and saline soils, making conditions unsuitable for vegetation growth. • Subsidence of mine area may impact on the land capability and land use of the area. • Mining may not comply with land use potential and land capability of the area.
Biodiversity	<ul style="list-style-type: none"> • Mining and associated activities may have an impact on the site-specific ecosystem, and could result in a loss of vulnerable, critically endangered, endangered and near threatened sensitive species (flora and fauna). • The mining activities may have a potential loss of Red Data species that could occur across the surface laydown area which will be transformed from associated mining activities. • Mining and associated activities may disturb indigenous flora in the area. • Resultant impacts on the flora and fauna may have a direct impact on ecological sensitivity in the area. • Potential isolation of sensitive areas may result in the degradation of indigenous flora and fauna species, and changes in populations reliant on movement or interchange between habitats. • Potential impact on biodiversity through mismanagement of dangerous goods and hazardous materials.



Environment	Anticipated Impact (excluding mitigation)
	<ul style="list-style-type: none"> • Mining activities may result in the generation of alien vegetation, which may encroach and impact on the surrounding ecosystem. • Mining activities may impact on the groundwater table, impacting on floral species dependant on groundwater in the area. • Potential subsidence may have an impact on slopes and ridges in the project area, resulting in a loss of potentially unique habitat conditions. This may affect sensitive breeding species associated in the mountainous areas within the project area. • Contamination from the poor management of wastes generated onsite may affect sensitive fauna and flora species within the area. • Potential loss of habitats resulting from uncontrolled burning and the spread of fires in the area. • The accumulative effect of emissions into the air (fugitive dust, PM, etc.) could have an adverse effect on the flora and fauna populations within the receiving environment. • Release, spillages and leakages of dangerous goods and hazardous materials such as chemicals, hydrocarbons and sewage may lead to a depletion of the natural ecosystem. • Impact of traffic and transport activities on flora and fauna species (construction, operation, decommissioning).
Hydrology (surface water) and geohydrology (groundwater)	<ul style="list-style-type: none"> • Impacts on surface water and groundwater recharge due to modification of infiltration rates from compaction of surfaces. • Erosion activities may result in the increase of sedimentation of runoff water which could alter flow rates, discharge rates and erosion/ sedimentation patterns of nearby rivers downstream. • Oxidisation of sulphur compounds in waste rock result in acid rock drainage which lowers acidity. The runoff may affect surface water quality, groundwater and biodiversity in the area. • Contamination of substances associated with the explosives used for mining activities can affect the surface water quality, groundwater and biodiversity in the area. • Potential impacts on surface water as a result of runoff contamination from the waste rock dump, tailings storage facility, wash plant area and product stockpile area. • Potential surface and groundwater contamination from spillages and release of process water from wash plant areas that diffuse and infiltrate the surrounding environment. • Potential pollution or impact on the hydrology and geohydrology resulting from incorrect storage and management of dangerous goods and hazardous materials and/ or other contaminants. • Pumping of groundwater required for safe mining conditions may have a direct impact on the water table (reducing natural groundwater recharge), and could have impacts on ecosystems and resultant loss of flora and fauna species. • Pumping of groundwater also increases the volume of discharge in the area, potentially altering downstream ecosystems and biota. • Release, spillages and leakages of chemicals, hydrocarbons and sewage (treated sewage) may lead to an impact on the surface and groundwater of the area. • Physical disruptions of aquifers may occur from blasting, causing groundwater to seep to lower aquifers, which could result in cross contamination of aquifer resources. • Potential impact from failures from mining activities and infrastructure (e.g. pollution control dam, tailings storage facilities, etc.).
Noise and vibration	<ul style="list-style-type: none"> • Noise is anticipated to be generated from blasting, mining operations, transportation, crushing, machinery etc. which may have a negative impact on the surrounding biophysical and socio-economic environment. • Construction and operational activities may lead to an increase in noise levels of the ambient environment noise levels.



Environment	Anticipated Impact (excluding mitigation)
	<ul style="list-style-type: none"> • Vibrations from blasting may impact on the underlying geology of the site, and could result in displacement of fauna species. • Vibrations could cause failure underground which could impact on the health and safety of employees, as well as the subsidence of topography.
Traffic	<ul style="list-style-type: none"> • There may be an increase in traffic within the immediate area which would result in the generation of dust, noise, air emissions and hydrocarbon spillages. • Increase traffic could cause road deterioration and have a negative impact on the movement of affected parties in the region (all phases of the project).
Visual	<ul style="list-style-type: none"> • The site clearance, opencast pit, mining, processing and associated activities may have an impact on the aesthetics of the area and impact on the general 'sense of place'. • The generation of dust and smoke may have visual impact within the surrounding area, resulting in associated health and safety impacts.
Archaeological, cultural and heritage	<ul style="list-style-type: none"> • The Proposed Project may have an impact on sites of archaeological, historic and cultural importance/ significance. • Potential artefacts that may be identified onsite could be affected from mining and associated activities (e.g. mining employees), including subsidence in the area. • Identified and unidentified graves may be impacted on from mining related activities and subsidence in the area. • Impacts of the road construction on sites of heritage significance may occur. • Impact on resultant fauna and flora species may result in a cultural impact for communities in the area.
Socio-economic	<ul style="list-style-type: none"> • Chrome mining in South Africa is supported by the country possessing over 70% of the world's chrome reserves. An expected increase in the demand for chrome is expected for the future due to stricter emissions legislation globally and a rise in the growth of vehicle production and sales. Due to increased development and demand for chrome, there is an increased need for chrome mines to produce precious metals for the market. • Job opportunities may be made available to the surrounding local communities. • Training may be provided to employees resulting in an improvement of the local skills base. • The mine may invest in social capital by undertaking a Social and Labour Plan, and promote sustainable local economic development in the surrounding areas. • Support may be given to the local and national economy by the purchase of goods and services required by the Proposed Project. • The production of metals will contribute towards: <ul style="list-style-type: none"> – Local development within the Local Municipality; – South Africa's foreign revenue; and – The anticipated generation of export income. • Socio-economic conditions in the project area will be impacted on both positively and negatively. • The Proposed Project may have negative impacts on the health and safety of the surrounding community and future employees from the generation of dust, air emissions (noxious gases and smoke), noise, vibrations, traffic, and contamination of surface and groundwater on downstream water users. • The mine may have an aesthetic impact on the surrounding communities. • The 'sense of place' may be affected, thereby impacting on the surrounding community. • Impact of the Proposed Project may result in a decreased of indigenous plants used for medicinal purposes having an effect on the community. • The project may create employment opportunities for the surrounding community. • Increase in economic growth and local economic development.



Environment	Anticipated Impact (excluding mitigation)
	<ul style="list-style-type: none"> • Training and skills development may be provided to unskilled labourers in the area, thereby expanding the local skills base. • The mine may result in an increase of individuals into the area. • Increased individuals may result in the establishment of illegal settlements. • The increase in individuals in the area may impact on social pathologies, such as social ills such as HIV/ AIDS, petty crime, stock theft, etc. • The presence of non-residents, perceived “outsiders” and contractors within the local environment could cause localised social tension due to the rural nature of the area. The opposition expressed by certain local communities and stakeholders, may result in conflict causing disruption to the local communities and the Proposed Project. • Social changes resulting from the Proposed Project including conflict for resources, conflict of cultures, and a change in nature of the area resulting in social change and potential for disputes. • Labour conflict with the mining company, regarding aspects such as wages and resources, could result in local social unrest. • Opportunities for entrepreneurial development could commence as a result of the Proposed Project. • The employment of local people could lead to the growth in the multiplier factor as the impact will extend to family members and other supporting services.

10.2 Issues raised by Interested and Affected Parties

The following still needs to be conducted; once it has been conducted an impact assessment will be provided to the relevant parties. Refer to section **Error! Reference source not found.** for the issues raised by IAPs.

10.3 Specialist Investigations

The impacts considered of sufficient importance as to warrant mitigation measures and management during the construction and operational phases of the proposed project will be assessed by specialists of the relevant field. The potential impacts and key issues which must be thoroughly investigated during the EIA include the following:

- Groundwater and contamination;
- Surface water and aquatic ecology;
- Noise;
- Terrestrial ecology;
- Archaeological;
- Palaeontology;
- Blasting and vibration;
- Socio-Economic;
- Visual;
- Soil and land capability; and
- Air quality.

During the EIA phase of the project all the potential impacts will be discussed in detail. Each specialist report as mentioned above will be used for the identification of the impacts and mitigation measures will be set up regarding those impacts.



11 METHODOLOGY USED IN DETERMINING THE SIGNIFICANCE OF ENVIRONMENTAL IMPACTS

11.1 Assessment Criteria

The criteria for the description and assessment of environmental impacts were drawn from the EIA Guidelines, National Environmental Management Act (Act No. 107 of 1998): EIA Regulations (2014) and as amended from time to time.

The level of detail as depicted in the EIA Guidelines was fine-tuned by assigning specific values to each impact. In order to establish a coherent framework within which all impacts could be objectively assessed, it was necessary to establish a rating system, which was applied consistently to all the criteria. For such purposes each aspect was assigned a value, ranging from one (1) to five (5), depending on its definition. This assessment is a relative evaluation within the context of all the activities and the other impacts within the framework of the project.

An explanation of the impact assessment criteria is defined below.

Table 16: Impact Assessment Criteria

EXTENT	
Classification of the physical and spatial scale of the impact	
Footprint	The impacted area extends only as far as the activity, such as footprint occurring within the total site area.
Site	The impact could affect the whole, or a significant portion of the site.
Regional	The impact could affect the area including the neighbouring farms, the transport routes and the adjoining towns.
National	The impact could have an effect that expands throughout the country (South Africa).
International	Where the impact has international ramifications that extend beyond the boundaries of South Africa.
DURATION	
The lifetime of the impact that is measured in relation to the lifetime of the proposed development.	
Short term	The impact will either disappear with mitigation or will be mitigated through a natural process in a period shorter than that of the construction phase.
Short to Medium term	The impact will be relevant through to the end of a construction phase (1.5 years).
Medium term	The impact will last up to the end of the development phases, where after it will be entirely negated.
Long term	The impact will continue or last for the entire operational lifetime i.e. exceed 30 years of the development, but will be mitigated by direct human action or by natural processes thereafter.
Permanent	This is the only class of impact, which will be non-transitory. Mitigation either by man or natural process will not occur in such a way or in such a time span that the impact can be considered transient.
INTENSITY	
The intensity of the impact is considered by examining whether the impact is destructive or benign, whether it destroys the impacted environment, alters its functioning, or slightly alters the environment itself. The intensity is rated as	
Low	The impact alters the affected environment in such a way that the natural processes or functions are not affected.
Medium	The affected environment is altered, but functions and processes continue, albeit in a modified way.
High	Function or process of the affected environment is disturbed to the extent where it temporarily or permanently ceases.
PROBABILITY	
This describes the likelihood of the impacts actually occurring. The impact may occur for any length of time during the life cycle of the activity, and not at any given time. The classes are rated as follows:	
Improbable	The possibility of the impact occurring is none, due either to the circumstances, design or experience. The chance of this impact occurring is zero (0 %).
Possible	The possibility of the impact occurring is very low, due either to the circumstances, design or experience. The chances of this impact occurring is defined as 25 %.
Likely	There is a possibility that the impact will occur to the extent that provisions must therefore be made. The chances of this impact occurring is defined as 50 %.



Highly Likely	It is most likely that the impacts will occur at some stage of the development. Plans must be drawn up before carrying out the activity. The chances of this impact occurring is defined as 75 %.
Definite	The impact will take place regardless of any prevention plans, and only mitigation actions or contingency plans to contain the effect can be relied on. The chance of this impact occurring is defined as 100 %.

The status of the impacts and degree of confidence with respect to the assessment of the significance must be stated as follows:

- **Status of the impact:** A description as to whether the impact would be positive (a benefit), negative (a cost), or neutral.
- **Degree of confidence in predictions:** The degree of confidence in the predictions, based on the availability of information and specialist knowledge.

Other aspects to take into consideration in the specialist studies are:

- Impacts should be described both before and after the proposed mitigation and management measures have been implemented.
- All impacts should be evaluated for the full-lifecycle of the proposed development, including construction, operation and decommissioning.
- The impact evaluation should take into consideration the cumulative effects associated with this and other facilities which are either developed or in the process of being developed in the region.
- The specialist studies must attempt to quantify the magnitude of potential impacts (direct and cumulative effects) and outline the rationale used. Where appropriate, national standards are to be used as a measure of the level of impact.

11.2 Mitigation

The impacts that are generated by the development can be minimised if measures are implemented in order to reduce the impacts. The mitigation measures ensure that the development considers the environment and the predicted impacts in order to minimise impacts and achieve sustainable development.

11.2.1 Determination of Significance-Without Mitigation

Significance is determined through a synthesis of impact characteristics as described in the above paragraphs. It provides an indication of the importance of the impact in terms of both tangible and intangible characteristics. The significance of the impact “without mitigation” is the prime determinant of the nature and degree of mitigation required. Where the impact is positive, significance is noted as “positive”. Significance is rated on the following scale:

Table 17: Significance-Without Mitigation

NO SIGNIFICANCE	The impact is not substantial and does not require any mitigation action.
LOW	The impact is of little importance, but may require limited mitigation.
MEDIUM	The impact is of importance and is therefore considered to have a negative impact. Mitigation is required to reduce the negative impacts to acceptable levels.
HIGH	The impact is of major importance. Failure to mitigate, with the objective of reducing the impact to acceptable levels, could render the entire development option or entire project proposal unacceptable. Mitigation is therefore essential.

11.2.2 Determination of Significance- With Mitigation

Determination of significance refers to the foreseeable significance of the impact after the successful implementation of the necessary mitigation measures. Significance with mitigation is rated on the following scale:



Table 18: Significance- With Mitigation

NO SIGNIFICANCE	The impact will be mitigated to the point where it is regarded as insubstantial.
LOW	The impact will be mitigated to the point where it is of limited importance.
LOW TO MEDIUM	The impact is of importance, however, through the implementation of the correct mitigation measures such potential impacts can be reduced to acceptable levels.
MEDIUM	Notwithstanding the successful implementation of the mitigation measures, to reduce the negative impacts to acceptable levels, the negative impact will remain of significance. However, taken within the overall context of the project, the persistent impact does not constitute a fatal flaw.
MEDIUM TO HIGH	The impact is of major importance but through the implementation of the correct mitigation measures, the negative impacts will be reduced to acceptable levels.
HIGH	The impact is of major importance. Mitigation of the impact is not possible on a cost-effective basis. The impact is regarded as high importance and taken within the overall context of the project, is regarded as a fatal flaw. An impact regarded as high significance, after mitigation could render the entire development option or entire project proposal unacceptable.

11.3 Assessment Weighting

Each aspect within an impact description was assigned a series of quantitative criteria. Such criteria are likely to differ during the different stages of the project's life cycle. In order to establish a defined base upon which it becomes feasible to make an informed decision, it was necessary to weigh and rank all the criteria.

11.3.1 Ranking, Weighting and Scaling

For each impact under scrutiny, a scaled weighting factor is attached to each respective impact (refer Table 7). The purpose of assigning weights serves to highlight those aspects considered the most critical to the various stakeholders and ensure that each specialist's element of bias is taken into account. The weighting factor also provides a means whereby the impact assessor can successfully deal with the complexities that exist between the different impacts and associated aspect criteria.

Simply, such a weighting factor is indicative of the importance of the impact in terms of the potential effect that it could have on the surrounding environment. Therefore, the aspects considered to have a relatively high value will score a relatively higher weighting than that which is of lower importance.

Table 19: Description of assessment parameters with its respective weighting

EXTENT		DURATION		INTENSITY		PROBABILITY		WEIGHTING FACTOR (WF)		SIGNIFICANCE RATING WITHOUT MITIGATION (SR WOM)	
Footprint	1	Short term	1	Low	1	Improbable	1	Low	1	Low	0-19
Site	2	Short to Medium	2			Possible	2	Low to Medium	2	Low to Medium	20-39
Regional	3	Medium term	3	Medium	3	Likely	3	Medium	3	Medium	40-59
National	4	Long term	4			Highly Likely	4	Medium to High	4	Medium to High	60-79
International	5	Permanent	5	High	5	Definite	5	High	5	High	80-100
MITIGATION EFFICIENCY (ME)				SIGNIFICANCE RATING WITH MITIGATION (SR WM)							
High				0.2		Low		0 – 19			
Medium to High				0.4		Low to Medium		20 – 39			
Medium				0.6		Medium		40 – 59			
Low to Medium				0.8		Medium to High		60 – 79			
Low				1.0		High		80 – 100			



11.3.2 Identifying the Potential Impacts Without Mitigation Measures (WOM)

Following the assignment of the necessary weights to the respective aspects, criteria are summed and multiplied by their assigned weightings, resulting in a value for each impact (prior to the implementation of mitigation measures).

Equation 1:

$$\text{Significance Rating (WOM)} = (\text{Extent} + \text{Intensity} + \text{Duration} + \text{Probability}) \times \text{Weighting Factor}$$

11.3.3 Identifying the Potential Impacts With Mitigation Measures (WM)

In order to gain a comprehensive understanding of the overall significance of the impact, after implementation of the mitigation measures, it was necessary to re-evaluate the impact.

11.3.4 Mitigation Efficiency (ME)

The most effective means of deriving a quantitative value of mitigated impacts is to assign each significance rating value (WOM) a mitigation efficiency (ME) rating. The allocation of such a rating is a measure of the efficiency and effectiveness, as identified through professional experience and empirical evidence of how effectively the proposed mitigation measures will manage the impact.

Thus, the lower the assigned value the greater the effectiveness of the proposed mitigation measures and subsequently, the lower the impacts with mitigation.

Equation 2:

$$\text{Significance Rating (WM)} = \text{Significance Rating (WOM)} \times \text{Mitigation Efficiency}$$

or $\text{WM} = \text{WOM} \times \text{ME}$

11.3.5 Significance Following Mitigation (SFM)

The significance of the impact after the mitigation measures are taken into consideration. The efficiency of the mitigation measure determines the significance of the impact. The level of impact is therefore seen in its entirety with all considerations taken into account.



12 THE POSITIVE AND NEGATIVE IMPACTS IN TERMS OF THE SITE LAYOUT THAT THE PROPOSED ACTIVITY AND ALTERNATIVES WILL HAVE ON THE ENVIRONMENT AND THE COMMUNITY THAT MAY BE AFFECTED

The sites for the infrastructure related to the proposed mining operations are located at the various points which are practical for the mining and would have the least impact on the surrounding environment. The areas used for above ground infrastructure can be altered to a greater extent in relation to receiving environment sensitivities and as such, there are areas which have been determined to be the “preferred alternatives” and those areas which can be considered “secondary alternatives”. These areas have been determined from a preliminary evaluation of how they are most optimally configured between the open pits, and away from potentially sensitive areas, in favour of proposed positioning on previously disturbed farming and agricultural land.

Similar positive and negative impacts are anticipated for alternative site locations as identified in Section 10.1 above. Specific alternatives will be assessed as part of the EIA Phase in collaboration with the relevant specialist studies.



13 THE POSSIBLE MITIGATION MEASURES THAT COULD BE APPLIED AND THE LEVEL OF RISK

The following proposed mitigations have been sourced from similar projects, the EAP’s experience and from discussions with stakeholders during the social scan. Please note that as the impacts from the Proposed Project have not been quantified and that additional input will be required from specialists and stakeholders, the possible mitigation measures proposed hereunder may be amended accordingly. Potential mitigation measures are included in the table below, which takes cognisance of construction, operational and closure phases of the Project.

It must be noted that proposed mitigation measures cannot be read individually as various mitigation measures relate to more than one aspect/ environment. Furthermore, it should be noted that the classification of an issue as a key issue during the Scoping Phase does not necessarily imply that a significant impact will result. The significance of an impact can only be ascertained once a specialist study has been conducted.

Table 20: Proposed Mitigation Measures

Environment	Proposed Mitigation Measure
Geology	<ul style="list-style-type: none"> • Formulate and implement a blasting design that will ensure the least impact on the environment. • The minimal amount of soils will be stripped on the sections to be blasted in order to reduce the potential for air blasts. • Blasting may only be undertaken by registered personnel. • Blasting schedules will be distributed to all surrounding communities. • Warning sirens will sound prior to the initiation of blasting to inform the surrounding employees and other stakeholders and to ensure safety of all people in the vicinity of the blast area. • The blasting area will be cordoned off prior to each blasting activity.
Topography	<ul style="list-style-type: none"> • All structures and infrastructure must be designed and operated with the aim of closure in mind. • Contractors and employees will be limited to the clearly defined access routes and areas to be constructed in order to limit site disturbance. • Rip compacted surfaces during closure. • Reshape footprint area to mimic natural topography as far as possible and to facilitate hydrological runoff. • Revegetation of support berms to veld grasses.
Air Quality	<ul style="list-style-type: none"> • All activities onsite will comply with the requirements of the National Environmental Management Air Quality Act (No. 39 of 2004). • Dust suppression techniques (i.e. wet suppression) will be implemented on unpaved roads and the co-disposal discard dump to limit the dispersion of dust. It is recommended that a chemical binding agent be incorporated to make the dust suppression techniques more efficient. • Limit the speed of vehicles on unpaved roads to 40 km per hour. • Vehicles carrying any loose aggregates or materials should be covered with tarpaulins or sheets at all times. • Limit the generation of dust from stockpiles onsite during construction, operation and closure. • Windbreaks in the form of shade cloth screens may be erected at exposed areas. • Where excessive dust exists watering down of blasts prior to blasting should be undertaken. • Blasting will be carried out in accordance with relevant legislation and using only the required amount of explosives. Blasting should occur on calm days to reduce the possibility of dust travel.



Environment	Proposed Mitigation Measure
<p>Soils, land use and land capability</p>	<ul style="list-style-type: none"> • Ensure that discard dumps, waste rock dumps, tailing storage facilities, etc. development allow for benching of slopes to facilitate operation phase vehicle access for the application of topsoil for rehabilitation purposes. Incorporate management plan which would allow for a phased expansion of the discard dumps, waste rock dumps, tailing storage facilities, etc. where topsoil from the expansion areas are utilised directly on the rehabilitation of the previously disturbed face. This would allow for topsoil not to be sterilised by stockpiling. • Prior to the commencement of construction activities, the project site will be clearly demarcated with fencing. Temporary barriers should be erected to protect surrounding habitats from construction activities and dumping of rubble and waste. • At least 300 mm of soils or until hard rock (if the soil cover is less than 300 mm deep) is reached will be removed from the area over which infrastructure will be placed. The topsoil (first 300 mm) is expected to have a higher fertility than the subsoil horizons and holds the vegetation seed bank. • Large areas of soil excavation should be phased to limit the erosion potential during rainfall events (more common between September and February). Construction activities outside of the designated development areas should be limited. • The topsoil should be stockpiled in designated areas and will be vegetated where required or possible to minimise erosion in accordance with the relevant procedures for use in ongoing rehabilitation purposes. • Topsoil should be kept separate from sub-soils during stockpiling. The stockpile shall be located away from seepage zones, floodlines, water courses and other ecological sensitive areas. Stockpiles will not exceed 2 m in height. • Sustainable erosion control measures (for wind and water erosion) will be implemented and maintained where necessary in areas disturbed by the construction (and operation) activities. Erosion control measures include, but are not limited to swales, sandbags, planting of vegetation, hydroseeding of topsoil and subsoil stockpiles and retention of vegetation. • Vegetation removal should be kept to a minimum and limited to the area of development. Where an impact to the vegetation outside of the development footprint occurs, rehabilitation measures need to be undertaken to maintain the baseline vegetation population and health. Weed and invader species growth needs to be appropriately managed within the mine area to maintain the baseline vegetation health. • Due to the potential for soil compaction resulting from vehicles, traffic should be limited to existing or proposed roadways as far as possible. The construction of roads should be limited in width and length as far as is practical to limit impacts. Where possible already disturbed areas will be utilised. • All disturbed areas should be rehabilitated as soon as possible during the life of mine in accordance with design specifications to reduce soil erosion. • Dirty and clean water will be separated by implementing clean and dirty water systems/ structures prior to construction to prevent pollution of clean water runoff or the existing dirty and clean water systems will be maintained. • The clean and dirty water systems and structures will be properly designed (according to GNR.704 of the National Water Act (No. 59 of 1998)) to prevent contamination of clean water sources and the erosion and scouring of the infrastructure. • All waste generated onsite will be adequately stored, and collected and disposed of by a reputable waste management contractor. No waste is to be burned or disposed of onsite. • Draw up a Waste Management Plan that will ensure that the principles stated in the 'waste hierarchy' are included and that all other waste is correctly classified and disposed of at the



Environment	Proposed Mitigation Measure
	<p>appropriate registered waste disposal site. The plan is to include procedures for each waste stream generated onsite.</p> <ul style="list-style-type: none"> • All waste management and waste disposal activities are to be undertaken in accordance with the National Environmental Management: Waste Act (No. 59 of 2008). • Draw up and enforce site rules for employees and contractors to ensure good housekeeping practices with respect to general waste. • All waste streams generated should be classified (as general, hazardous or recyclable wastes) and separated at source, in accordance with GNR.634 of 2013. • A waste management contractor is to be identified, a contract agreed upon and the waste management contractor is to collect all waste generated from the site and remove it to a permitted waste disposal facility. • All waste collection storage areas will be managed effectively to avoid any potential surface and groundwater contamination, including the generation of litter. • All access routes must be adequately maintained (potholes, erosion damage, corrugations, etc.). • The use of herbicides and pesticides and other related horticultural chemicals should be carefully controlled and only applied by personnel adequately certified to apply pesticides and herbicides. A procedure for the storage, management and application of herbicides and pesticides is to be developed. Herbicides and pesticides should not be applied on very windy days and at all times their application should be directed away from surrounding land, to prevent damage to organisms in the surroundings. Ensure herbicides and pesticides are only directed to areas required and only applied by a certified person. • Fertilisers should not be used excessively, and slow release fertilisers and organic products should be used in preference to highly soluble and inorganic fertilisers. Only natural fertilisers should be utilised. • The use of herbicides and pesticides will be applied in compliance with the Fertilisers, Farm Feeds, Agricultural Remedies and Stock Remedies Act (No. 46 of 1947). • Fires will only be allowed in facilities specially designed and constructed for this purpose within the project site. No open fires or uncontrolled fires will be permitted as outlined in The National Veld and Forest Fire Act (No. 101 of 1998). • Firefighting measures, such as fire extinguishers, will be located in strategic locations onsite and the workforce will be made aware of fire prevention and firefighting measures. • Soil and water contamination from diesel spills, particularly at the storage tanks, will be prevented by ensuring these areas are adequately constructed on barrier foundations with the statutory bund walls. • A comprehensive Material Safety Data Sheet (MSDS) must be obtained from the suppliers for all dangerous goods and chemicals stored and/ or utilised onsite. All MSDS's must be displayed where dangerous goods and/ or chemicals are stored and utilised. MSDS's will take cognisance of the storage, handling, transportation and disposal of chemicals and hazardous materials. MSDSs are to be updated on a regular basis. • An Emergency Preparedness and Response Plan (RPRP) is to be developed and updated regularly. • All spillages and leakages must be reported as indicated on the EPRP. • All chemicals and other hazardous materials are to be stored in designated and bunded areas, where the bunded area is impermeable and is impervious to the stored substance. The bunded area will contain 110% volume of the largest container stored.



Environment	Proposed Mitigation Measure
	<ul style="list-style-type: none"> • All bunded areas are to be adequately signposted identifying the material, volume and appropriate SANS code. Furthermore, safety signs indicating "No Smoking" and "Danger" are to be placed in and around flammable storage areas. • Any water that collects in bunds will not be allowed to stand. Should the water be contaminated, it is to be removed from site as hazardous waste. Clean storm water contained within the bunds may be reused in the wash plant as process water. • Used fuels, oils, paints, solvents and greases should be stored in drums or other suitable containers in a bunded area. These should be labelled, sealed and disposed of at an appropriate disposal or recycling facility. Under no circumstances are the substances to be disposed of on-site or into the surrounding environment. • All waste fuel, oily and chemically impregnated rags will be stored in leak-proof containers including a lid and will be disposed of at an appropriate disposal facility. • A procedure for the storage, handling and transportation of the different dangerous goods, chemicals and hazardous materials has been drawn up for the mine and must be strictly enforced. • Material Safety Data Sheets will be updated regularly and be available onsite. • If a major spillage or leakage occurs the contractor will be called out to clean the contaminated area and rehabilitate the soils, as appropriate. • If any other minor spillage or leakage occurs the spillage will be cleaned immediately, and the contaminated area will be rehabilitated, as appropriate. • Contracts will include specifications that make employees and contractors aware of the necessity to prevent spillages by the implementation of good housekeeping practices. • A procedure for the storage, handling and transportation of the different hazardous materials has been drawn up for the mine and must be strictly enforced. The plan is to comply with the requirements of SANS 10234, 10228 and 10229. • An Environmental Awareness Programme will be instituted. • The maintenance of the chemical toilets will be the responsibility of an external contractor. Ablution facilities shall be within 100 m from places of work, but further than 100 m from any watercourse or borehole. Remove the sewage from the temporary toilets and dispose thereof in a controlled manner. Records of all sewage removed from site and safely disposed of/ treated are to be provided to the mine and maintained onsite. • Sewage contained within the septic tank is to be removed by an external contractor on a weekly basis.
<p>Biodiversity</p>	<ul style="list-style-type: none"> • Animals should be given sufficient time to relocate from the project area prior to the initiation of construction activities. • Protected floral and faunal species will require permits for destruction/ translocation. • Locate, translocate and monitor Conservation Important (CI) flora and fauna. • Include biodiversity conservation in staff and contractor training and inductions. Toolbox Talks are to include aspects of biodiversity. • All structures and infrastructure must be designed and operated with the aim of closure in mind. • Prohibit the disturbance of biodiversity beyond the construction and operation footprints. • Prohibit driving off the main access route. • Rehabilitate existing alien-invaded wetlands within the area as an offset option. • Water collected in the cut-off trench should remain clean, and be returned to the receiving environment. The release of water into the receiving environment should be dissipated to prevent erosion.



Environment	Proposed Mitigation Measure
	<ul style="list-style-type: none"> • If roads pass along steep gradients (≥ 1 in 10), erosion control measures should be implemented, as deemed appropriate by registered civil engineers. Effective storm water management measures should be implemented and maintained along these roads. • All vehicles and equipment will be serviced regularly and will be kept in good working order within designated areas. • An Alien and Invasive Management Plan should be developed for the Proposed Project. A detailed “on-the-ground” assessment of alien species within the greater study area, their density and distributions should form the baseline. Furthermore, stakeholder engagement strategies should be included into the planning phase of the programme. By ensuring that effective consultation takes place with local communities and all affected parties, any potential misunderstandings and disagreements can be resolved or accommodated in advance. • A monitoring programme will be implemented that will ensure that all weeds and alien species will be eradicated in and around the project area. Measures will also be implemented to prevent the spreading of these species throughout the life of mine. • At least 300 mm of soils or until hard rock (if the soil cover is less than 300 mm deep) is reached will be removed from the area over which infrastructure, including co-disposal discard dump facility) will be placed. The topsoil (first 300 mm) is expected to have a higher fertility than the subsoil horizons and holds the vegetation seed bank. • The movement of any animals intending to flee the impacted area will not be obstructed. Abuse and hunting/ chasing of animals by workers will not be allowed. • Stockpiles should be kept clear of weeds and alien vegetation. • Collection of traditional medicinal plants will not be permitted. No area will be cleared of vegetation for camping purposes. • Should a complaint be received relating to wildlife interaction, the Environmental Coordinator will respond to the complaint within 24 hours. All complaints will be reported in a complaints register. • Photographs of the project site before, during construction, operation, rehabilitation and after closure should be taken and maintained on record. • No marking or disfiguring of natural rocks, trees and vegetation is permitted. Marking may be done by stakes and tags. • If an electrical boundary fence is constructed, this will be inspected regularly for accidental mortalities of animals such as tortoises. • An on-going rehabilitation programme will be drafted that will provide best management guidelines for the restoration and rehabilitation of the remnant portions of biodiversity. • The harvesting of natural vegetation for fuel wood or any other purposes will be strictly prohibited. • The poaching and hunting of animals will be strictly prohibited.
Hydrology (surface water) and geohydrology (groundwater)	<ul style="list-style-type: none"> • Clean and dirty water systems are to be installed and well maintained throughout the life of mine. • Where significant pollution potential is identified in terms of the clean and dirty water systems, these areas will be lined (i.e. PCDs, tailings storage facilities, etc., storm water cut-off trench and clean: dirty water systems are to be lined). • All topsoil stockpiles will have storm water diversion berms for protection against erosion and contamination by dirty water. • Where significant pollution potential is identified in terms of the clean and dirty water systems, these areas will be lined.



Environment	Proposed Mitigation Measure
	<ul style="list-style-type: none"> • Do not discharge waste of any nature, or any foreign material into any watercourse or associated buffer. • No untreated water should enter the receiving environment. Water released into the receiving environment must comply with the Resource Quality Objectives or if these have not been set then the Target Water Quality Range for the protection of the receiving environment. • A comprehensive surface and groundwater monitoring programme will be implemented. • Crossings of any water resources should include effective implementation of drainage control, such as the building of bridges, placement of culverts or drifts, as deemed appropriate by registered civil engineers. • The mine must ensure that the necessary water licenses are in place for the dewatering activities, as well as for water discharge purposes. • Any activity impacting on a watercourse, or associated buffer, should only occur after authorisation by the relevant authorities. • Dirty water and process water will be recycled. No contaminated water will be discharged directly into the environment. All contaminated water originating onsite will be stored within the PCDs which are designed to cater for the 1:100 year flood event. • Spill response procedures are to include removal and disposal of potentially contaminated/contaminated water and any used absorbent materials. • Should vehicle, machinery or equipment spillages or leakages be observed on-site, drip trays are to be placed to ensure no soil contamination occur. Should a spill or leak occur, the resultant spillage will be cleaned immediately. • Adequate spill kits should be placed in strategic locations throughout the project site. • Soils that may be contaminated by leakages and spillages associated with construction and operational activities are to be removed as soon as possible to prevent further contamination of the soils or underlying groundwater. Contaminated soil will be treated as hazardous waste and disposed of at an appropriate disposal facility offsite. • Water pipelines on the site will be inspected for defects, cracks and leakages. • To limit the generation of dirty water during the decommissioning of the plant and administration area, it is recommended that the storm water management infrastructure associated with these areas (channels and PCD) remain to capture dirty runoff. • Once the site has been fully decommissioned, there should be limited water quality impacts, provided that the site is properly rehabilitated. To limit erosion, it should be ensured that the soils maintain their pre-development characteristics as far as is practicable to ensure infiltration and vegetation rooting. The vegetation health should be returned to the baseline health where practically feasible. • Formulate and implement a comprehensive water quality monitoring plan. • Groundwater abstraction is a critical issue in area, and water should also be sourced from an alternative supply such as from rainwater harvesting. • The comprehensive groundwater monitoring programme for water levels and the management thereof will be undertaken. • Should any negative effects groundwater be identified, the surrounding neighbours as well as the relevant authorities will be notified. • The boreholes onsite will be monitored for quality and quantity on a monthly basis and results supplied to DWS. These results will be communicated to relevant stakeholders biannually. • Should it be determined by geohydrological studies that dewatering activities have an impact on the surrounding groundwater users the mine will put a plan in place to supply these users.



Environment	Proposed Mitigation Measure
	<ul style="list-style-type: none"> • Water abstracted for dewatering activities should be returned to the receiving environment under the requirements of the Resource Quality Objectives or if these have not been set then the Target Water Quality Range for the protection of the receiving environment. The requirements of the Reserve Determination must also be taken into consideration in terms of volume and timing of releases. Should it not be possible to discharge the water to the receiving environment it must be reused in the underground workings. • Ensure that pollution control dams on surface are adequately sized to accommodate excess underground water. The pollution control dams must be lined to prevent seepage to the underlying aquifers. • Should dewatering activities be required, an application for a water use license will be made to the DWS. • Prevent dirty water runoff from leaving the general mining area. • All dirty water from the plant area must be contained in the plant pollution control dams and reused in the mining process. • The objective at mine closure is to negotiate with, and get the groundwater closure objectives approved by Government during the closure phase of the project, based on the results of the monitoring information obtained during the construction and operational phases of the Proposed Project. • Continued groundwater quality and groundwater level monitoring for a period of two years after mining ceases is required to establish post-closure groundwater level and quality trends. The monitoring information will be used to update, verify and recalibrate the predictive tools used during the study to meet legal requirements.
Noise and vibration	<ul style="list-style-type: none"> • Construction activities should be limited to daylight hours in noise sensitive areas. Where construction activities are required after dark, notification is to be sent to affected landowners/ communities. • Blasting activities are to be controlled to minimise noise, air blast and timing of explosives. • Construction and operation activities will comply with the standard requirements of the Occupational Health and Safety Act (No. 85 of 1993) and the Mine Health and Safety Act (No. 29 of 1996). • All equipment, machinery and vehicles are to be kept in good working order and inspected regularly to ensure integrity and reliability and prevent excessive noise. Vehicles, machinery and equipment generating excessive noise should be fitted with appropriate noise abatement measures. • Staff working in areas of excessive noise (above 75 dBa) should be provided hearing protection equipment (personal protective equipment). • Where noise becomes a nuisance management measures will be investigated and implemented to address these. • Comprehensive noise monitoring must be undertaken, and mitigation measures implemented where required. This will be applied to night conditions. • Selecting construction equipment with lower sound power levels. • Reduce noise generation during the operational phase of the project (enclose conveyor systems, enclosing of continuous noise sources (i.e. pumps) within sound absorbing enclosures, regular maintenance of equipment to reduce the generation of additional unwanted noise). • Vehicles will be equipped with mufflers where practical to reduce the emission of noise.
Traffic	<ul style="list-style-type: none"> • The applicant will ensure that all contracted logistics companies have professional driver training programmes in place.



Environment	Proposed Mitigation Measure
	<ul style="list-style-type: none"> • Ensure safety aspects are implemented to reduce traffic collisions and increase pedestrian safety. • Increase the visibility of heavy vehicles by utilising sufficient reflectors and active headlights. • Signs will be erected indicating the road speed. • Traffic notification signs will be erected along the access roads used by for the mine. These signs will include speed, stop, high accident zones, water courses, etc. • Erect lighting at high-risk populated areas • Mine management is to respond immediately to any incident involving a mine vehicle. • Vehicle speed will be managed and will not exceed 40 km per hour on unpaved, haul and mine roads. • All construction and mine vehicles travelling on public roads will adhere to the relevant traffic laws and regulations. • General road rules will be enforced and complied with at all times. • No deviation from approved access routes will be permitted. • During fuel/ chemical delivery, the tanker driver and associated qualified staff are to be present at all times during product offloading. • All vehicles and equipment will be serviced regularly and will be kept in good working order within designated areas. • Vehicles will be equipped with mufflers where practical to reduce the emission of noise. • Vehicles should not be overloaded with building material or ore. • Vehicles should not be overfilled at the fuelling depots. Re-fuelling must be supervised. Any spillage or accidental discharge of fuel onto the soil or vegetation must be reported to the mine’s environmental coordinator and the necessary management measures should be in place for the cleaning of spillages.
Visual	<ul style="list-style-type: none"> • The minimum amount of existing vegetation, borrow material and topsoil should be removed from construction areas. Wherever possible, utilise existing natural vegetation in site design and landscaping. Eradication of vegetation should be done in ‘natural manner’, avoiding harsh straight lines. • An ecological approach to rehabilitation and vegetative screening measures, as opposed a horticultural approach to landscaping, should be adopted. An appropriately qualified person should be consulted for this purpose. • Ensure litter is not generated onsite. Staff and contractors found littering will be punished by fines. • Remove all structures and hard surface road materials in line with closure and rehabilitation plan. • Rehabilitate transformed footprints area to veld grasses and other indigenous plants, restoring agricultural land uses.
Archaeological, cultural and heritage	<ul style="list-style-type: none"> • Much heritage material, by its very nature, occurs below ground. The contractors should therefore keep in mind that heritage sites might be exposed during the construction work. If a grave, midden or archaeological artefact is uncovered on site, or discovered before the commencement of work, then all work in the immediate vicinity of the graves/ middens will be stopped and the Environmental Coordinator informed of the discovery. If anything is noticed once work has commenced, work in the area should be stopped immediately and the occurrence should immediately be reported to the South African Heritage Resources Agency (SAHRA), or a museum, preferably one at which an archaeologist is available. The archaeologist should then investigate and evaluate the finding.



Environment	Proposed Mitigation Measure
	<ul style="list-style-type: none"> • The removal of a Heritage site must be undertaken by means of controlled excavation of the site by qualified personnel, prior to construction. The necessary permits must be obtained from SAHRA. The removal of a site will be done by a qualified archaeologist and in consultation with the SAHRA. • The Environmental Coordinator is to be kept informed of all activities relating to heritage. • Work may only resume once clearance is given in writing by an archaeological consultant. • Where necessary, heritage sites will be fenced off in order to protect the sites during construction activities. • Any measures applied by an archaeologist, in the sense of excavation and documentation, should, if merited, be published in order to bring this information into the public domain.
<p>Socio-economic</p>	<ul style="list-style-type: none"> • The mine must capture all public complaints in a grievance mechanism housed within an Environmental Management System. • Grievance mechanisms should be appropriate to respond to community concerns around risks and potential adverse impacts of the Proposed Project. • Establish a procedure for receiving, addressing, and recording/ documenting complaints. This procedure should clearly define who can raise complaints, and ensure that the confidentiality of the persons raising the complaint is protected. It should also be easily accessible and understandable to the members of the affected community and should be communicated to the affected community. • A public complaints register is to be available at the security office at the entrance to the mine. • All issues/ complaints received by stakeholders, authorities, etc. will be documented, and the necessary corrective and preventive actions identified. • An open channel of communication will be maintained throughout the life of the project to ensure that all issues are raised and addressed. • Displacement of communities should be minimised as far as practically possible. When displacement cannot be avoided, the Mining Right holder will offer displaced communities and persons compensation for loss of assets at full replacement cost. A Resettlement Action Plan or Livelihood Restoration Plan will be developed and implemented by the Mining Right holder. • As far as possible, labour will be sourced from the local, nearby formal (not squatter) settlements, where appropriate skills exist. • The Mining Right holder will encourage contractors to utilise local employment, services and consumables. • The recruitment philosophy as part of the Social and Labour Plan will be provided to the contractors. • Non-core activities related to the construction phase of the project will be identified and out-sourced to local service providers, where the skills exist. • Contractors must make all efforts to obtain services and consumables from local entrepreneurs. The Mining Right holder will ensure that contractors having a local SMME policy and that the policy is adequately implemented. • The mine will comply with their Social and Labour Plan. • No informal settlements will be allowed on mine property. • PPE must be made available to all employees and contractors, during construction, operation and closure. • Draw up a safety and health plan specifying the required safety related requirements during the construction phase. • Condoms will be made available to all staff and workers.



Environment	Proposed Mitigation Measure
	<ul style="list-style-type: none"> • Strict penalties will be built into tenders to deal with issues such as petty crime, stock theft, fence cutting, trespassing, the closing of farm gates etc. • The mine will routinely inspect the boundary fences around the mine. • The mine will ensure that an HIV/ AIDS strategy is in place and effectively implemented at the mine. • A grievance mechanism will be put in place and all employees and project-affected parties will be made aware of its existence and the procedures contained therein. • Principles of equality, BBEEE, gender equality and non-discrimination will be implemented. • The contractor is to ensure that all staff onsite will be in possession of a South African identity document, or suitable valid work permit from the Department of Home Affairs. • All contact with external stakeholders shall be courteous at all times, and the rights of the stakeholders should be respected at all times. • All visitors to site, contractors and employees will be inducted in site health and safety procedures. • Access of all construction and material delivery vehicles will be controlled through one security entrance. • Areas for the storage of fuels and other flammable materials will comply with standard fire safety regulations and may require approval from the Municipal Fire Department. • Adequate sanitary facilities and ablutions will be provided for construction staff, with a recommended maximum ratio of 15 workers to one ablution facility. • Sufficient drinking water will be made available to all contractors, sub-contractors and onsite staff. The drinking water container will be strategically located and will be signposted as potable water. • Demarcated areas for food preparation should be designated and provided with adequate washing, seating and general refuse receptacles, Refuse bins should be removed from food preparation areas at least three times a week, or as directed by health regulations. • The site is to have 24 hour security. • Unauthorised social activities are to be prohibited, which include, but are not limited to, consumption of or illegal selling of alcohol, drug utilisation or selling, and onsite prostitution. • Driving under the influence of alcohol is prohibited. • No firearms are to be permitted onsite. • Activities undertaken onsite are to be in accordance with an Occupational Health and Safety Plan, Community Security Plan as well as the Emergency Preparedness and Response Plan. • First aid facilities will be available onsite. • SABS standards and specifications governing dangerous and high risk processes will be applied. • High risk areas, including but not limited to scaffolding, heights and open excavations will be demarcated and clearly marked and include, where relevant, adequate warning signs. • Emergency numbers for the police, fire department, clinic and relevant responsible staff will be made available in conspicuous locations. • All warning signs will be made available in English and applicable local languages. • All necessary measures to ensure that job seekers do not flock to the project site or local villages looking for work will be undertaken.



14 THE OUTCOME OF THE SITE SELECTION MATRIX, FINAL SITE LAYOUT PLAN

Please note that a final site layout plan has not been developed as this will be engineered during the EIA Phase of the project following the completion of specialist studies and stakeholder input. Furthermore, details regarding the site layout will be considered during the EIA Phase with the input of relevant independent specialists.

Refer to Appendix 4 which shows the preliminary site layout plan.

15 MOTIVATION WHERE NO ALTERNATIVE SITES WERE CONSIDERED

The sites for the proposed opencast and underground mining operations were selected based on availability of the Chromite seams/reserves to be mined. Minerals can only be mined where identified and verified, therefore it was not practical to select any other sites.

The sites for the infrastructure related to the proposed mining operations are located at the various points which are practical for the mining and would have the least impact on the surrounding environment. The areas used for above ground infrastructure can be altered to a greater extent in relation to receiving environment sensitivities and as such, there are areas which have been determined to be the “preferred alternatives” and those areas which can be considered “secondary alternatives”. These areas have been determined from a preliminary evaluation of how they are most optimally configured between the open-pits, and away from potentially sensitive areas, in favour of proposed positioning on previously disturbed farming and agricultural land. The exact details and detailed layout plans for the infrastructure has not yet been determined, and will be evaluated within the EIA process.

During the alternative analysis in the EIA phase, a detailed assessment will be done of all these areas, to determine which of the areas would be most suitable for aboveground infrastructure, taking into consideration environmental conditions, topography, financial feasibility, the linkage between pit and surface infrastructure, access to various parts of the site and existing infrastructure

16 STATEMENT MOTIVATING THE PREFERRED SITE

Refer to section above.



17 PLAN OF STUDY FOR THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

17.1 Description of alternatives to be considered including the option of not going ahead with the activity

In the case of the Proposed Project, possible alternatives will need to be identified through discussions with authorities, discussions with stakeholders (public and focus group meetings), reviewing of existing environmental data, specialist inputs/ studies and the design team. The following categories to assess alternatives for the Proposed Project will be undertaken during the EIA Phase of the project and will include the following:

- Location alternatives
 - Location of tailings storage facility;
- Layout alternatives
 - Layout of waste rock dumps
 - Layout of the plant
 - Layout of the tailings storage facilities
- Service alternatives
 - Water provision
 - Energy alternatives
 - Access alternatives
 - Waste disposal
- Technology alternatives
 - Tailings storage facility construction alternatives
- The “no-go” alternative

The above-mentioned alternatives will be assessed during the EIA Phase of the project.

Please refer to Section 8 for alternatives already considered. Should any environmental fatal flaws be identified during the specialist investigation, these will be included within the alternative investigations in order to determine the possible implications thereof on the proposed development.

17.2 Description of the aspects to be assessed as part of the environmental impact assessment process

The key environmental issues identified during the initial Scoping phase were determined through an internal process based on similar developments, desktop analysis, specialist consultation, revision of existing information, historical data, consultation with Interested and Affected Parties and the relevant Stakeholders. Potential risk sources/impacts were identified by the Red Kite Environmental Solutions team and various specialists who have been on site to appraise the environment and identify the potential impacts of the development.

The EAP hereby undertakes to assess the following aspects which are related to the proposed impacts of the proposed mining operation which was identified in Section 3.1:

- Groundwater and contamination;
- Surface water and aquatic ecology;
- Noise;
- Terrestrial ecology;
- Archaeological;
- Palaeontology;
- Blasting and vibration;
- Socio-Economic;
- Visual;
- Soil and land capability; and



- Air quality.

17.3 Description of Aspects to be assessed by Specialists

The specialist will assess the following aspects which are related to the proposed impacts of the proposed mining operation, which were identified in Section 3.1: Groundwater and contamination; Surface water and aquatic ecology; Noise; Terrestrial ecology; Archaeological; Paleontology; Blasting and vibration; Socio-Economic; Visual; Soil and land capability; and Air quality.

The identification and initial assessment of environmental aspects revealed the following potentially significant environmental aspects which require further detailed assessment, to be conducted during the EIA-phase (**Table 13**).

Table 21: List of Specialists and Specialist Studies

Specialist Study	Specialist
Socio-economic Impact Assessment	Gudani Consulting
Soil and Land Capability Assessment	Elemental Sustainability
Air Quality Impact Assessment	EcoElementum
Heritage Impact Assessment	A Pelsers Archaeological Consulting
Visual Impact Assessment	Elemental Sustainability
Blasting and Vibration Assessment	Blast Management and Consulting
Environmental Noise Impact Assessment	Enviroroots
Geohydrological and Contamination Assessment (including Waste Classification)	Delta-h
Surface water and Aquatic Ecology Assessment	Oasis Environmental Specialists
Hydrology (if required)	TBC
Terrestrial Ecology Assessment	Enviridi Environmental Consultants
Stormwater Management Plan and engineering designs (including TSF, waste rock and PCD)	Nurizon Consulting
Palaeontology Assessment (desktop)	Marion Bamford Consulting
Public Participation	Red Kite Environmental Solutions

The specialists are to provide an outline of the approach used in the study. Assumptions and sources of information must also be clearly identified. The knowledge of local people should be incorporated in the study. The description of the study approach shall include a short discussion of the appropriateness of the methods used in the specialist study in terms of local and international trends and specific or best practice.

The specialists will employ the following basic methodology:

- Site visits;
- Sampling, where necessary;
- Desk top studies;
- Assessment of baseline data;
- Assessment of impacts;
- Development of appropriate mitigation measure; and
- Documentation of the findings in the form of reports.



17.3.1 Description of the Affected Environment

A description of the affected environment must be provided. The focus of this description must be relevant to the specialist's field of expertise. The specialist must provide an indication of the sensitivity of the affected environment. Sensitivity, in this context, refers to the "ability" of an affected environment to tolerate disturbance, for example, if disturbance of the natural habitat results in the permanent loss of its biodiversity. The affected environment could be categorised as having a "low tolerance" to disturbance and is, therefore, termed a highly sensitive habitat. If, on the other hand, a habitat is able to withstand significant disturbance without a marked impact on its biodiversity, the affected environment could be categorised as having a high tolerance to disturbance (i.e. "low sensitivity" habitat).

17.3.2 Legal requirements

As per the requirements, the specialist should identify and list the relevant South African legislation and permit requirements pertaining to the development proposals. He/she should provide reference to the procedures required to obtain permits and describe whether the development proposals contravene the applicable legislation.

17.3.3 Impact Identification and Assessment

The specialist must make a clear statement, identifying the environmental impacts of the construction, operation and management of the proposed development. As far as possible, the specialist must quantify the suite of potential environmental impacts identified in the study and assess the significance of the impacts according to the criteria set out below. Each impact will be assessed and rated. The assessment of the data must, where possible, be based on accepted scientific techniques, failing which the specialist is to make judgements based on his/her professional expertise and experience.

The impact assessment will provide an evaluation of the significance of each of the three phases of the project i.e. design / construction, operational phases and closure/post closure.

17.3.4 Mitigation Measures

Mitigation measures should be recommended in order to enhance benefits and minimise negative impacts and they should address the following as discussed.

Mitigation Objectives: What level of mitigation must be aimed at?

For each identified impact, the specialist must provide mitigation objectives (tolerance limits) which would result in a measurable reduction in impact. Where limited knowledge or expertise exists on such tolerance limits, the specialist must make an "educated guess" based on his/her professional experience.

Recommended Mitigation Measures

For each impact the specialist must recommend practical mitigation actions which can measurably affect the significance rating. The specialist must also identify management actions, which could enhance the condition of the environment. Where no mitigation is considered feasible, this must be stated and reasons provided.

Effectiveness of Mitigation Measures

The specialist must provide quantifiable standards (performance criteria) for reviewing or tracking the effectiveness of the proposed mitigation actions, where possible



17.3.5 Recommended Monitoring and Evaluation Program

The specialist is required to recommend an appropriate monitoring and review programme, which can track the efficacy of the mitigation objectives. Each environmental impact is to be assessed before and after mitigation measures have been implemented. The management objectives, design standards etc., which, if achieved, can eliminate, minimise or enhance potential impacts or benefits must, wherever possible, be expressed as measurable targets. National standards or criteria are examples, which can be stated as mitigation objectives.

Once the above objectives have been stated, feasible management actions, which can be applied as mitigation, must be provided. A duplicate column on the impact assessment tables described above should indicate how the application of the proposed mitigation or management actions has reduced the impact. If the proposed mitigation is to be of any consequence, it should result in a measurable reduction in impacts (or, where relevant, a measurable benefit).

17.4 Proposed Method of Assessing the Environmental Aspects Including the Proposed Method of Assessing Alternatives

Please refer to Section 11 that explains the methodology to be used for assessing the environmental aspects including the proposed method of assessing alternatives.

17.5 Proposed method of assessing duration and significance

Section 11 also includes the proposed method of assessing duration and significance.

17.6 The Stages at which the Competent Authority will be consulted

Subsequent to the submission of the Scoping Report, Red Kite Environmental Solutions would require additional consultation with the following Departments regarding the way forward:

- Department of Water and Sanitation;
- Department of Mineral Resources and Energy; and
- Limpopo Department of Economic Development, Environment and Tourism.

The Public Participation process as conducted by Red Kite Environmental Solutions has already started. All comments will be included in the final comments and response report, as an appendix within the EIA for submission.

17.7 Particulars of the public participation process with regard to the Impact Assessment process that will be conducted

All Registered I&APs will be kept informed and will be able to provide input into every phase of the EIA process.

Comments and responses will be incorporated into the following documents involved in the EIA process: The following documents will be made available to the communities within the area. The communities will be informed of the locations of where the draft documents will be and to whom the comments and issues raised need to be sent.

- Scoping Report
- Specialist Reports
- EIA and EMPr Report

Once all the comments and responses from all the I&AP's have been received, it will be incorporated into the final document. The issues and comments will be addressed and mitigation measures will be set for each issue. Once all the before mentioned aspects have been addressed the documents will be finalised and the final documents will be



submitted to the relevant Departments for authorisation.

Once the department gives authorisation for the proposed project, all the Registered I&AP's will be notified thereof, and they will be informed of the commencement dates of the proposed mining operations.

The proposed public participation process for the remainder of the Environmental Impact Assessment will consist of the following as outlined below:

17.7.1 Report Comment Periods

- Presenting all registered Interested and Affected Parties, stakeholders and government departments with the opportunity to read and comment on environmental impact assessment reports, including all specialist reports;
- Presenting registered Interested and Affected Parties, stakeholders and government departments with the opportunity to read and comment on draft environmental management plans compiled in terms of regulations;
- Presenting registered Interested and Affected Parties and stakeholders with the opportunity to read and comment on IWWMP

17.7.2 Public Meetings and Open Days

A public information session/meeting to present and discuss the findings of the Environmental Impact Assessment and related specialist reports will be held. This information session and discussion will give stakeholders and any other members of the public the opportunity to come and read reports, discuss the project with specialists and EIA consultants and have access to photos and reports during the day. The information provided will include the site plan and sufficient detail of the intended operation and the typical impacts of each activity, to enable them to assess what impact the activities will have on them or on the use of their land.

Once I&AP's have had the chance to review the draft documents, public meetings will be held to discuss these reports.

17.7.3 Description of the information to be provided to Interested and Affected Parties

The following documents will be made available to the communities within the area as well as all registered Interested and Affected parties:

- Draft Scoping Report;
- Specialist Reports; and
- EIA/EMPr Report.

All information obtained within these documents, including the site plans and impacts expected as well as all the relevant information as required by the competent authority as contained within the prescribed DMR format EIA/EMP will be made available to the I&APs for comment.

Once all the comments and responses from all the registered I&AP's have been received, it will be incorporated into the final document. The issues and comments will be addressed, and mitigation measures will be set for each issue.



17.8 Description of the tasks that will be undertaken during the environmental impact assessment process

During the Impact Assessment Phase of the EIA, issues identified during scoping are assessed by environmental specialists. The outcome of the assessments will be presented in the draft EIA, which together with an Environmental Management Programme (EMPr), will be made available for interested and affected parties to comment on.

Based on the findings in the EIA / EMPr, the Responsible Government Authority will decide, in consultation with other relevant authorities, whether the proposed Mphahlele Mine project and associated infrastructure activities may proceed or not, and under what conditions.

The application process followed for the mining right has been designed to meet the requirements of both the Mineral and Petroleum Resource Development Act (Act 28 of 2002) and National Environmental Management Act (Act 107 of 1998; amended 2006). The authorisation process includes:

- Scoping Phase:
 - Stakeholder Notification;
 - Authority Consultation;
 - Capturing of Issues and Concerns;
 - Compilation of a Stakeholder Database;
 - Identification of Potentially Significant Impacts;
 - Identification of Potentially Sensitive Environmental Aspects;
 - Identification of Required Specialist Studies;
 - Compilation of a Scoping Report (this document), including:
 - Plan of Study for SIA/EIA/EMP.
 - Comments and Response Report; and
 - Stakeholder Review of Documentation;
 - Submission and approval of Scoping Report by relevant authorities.

- Impact Assessment Phase:
 - Undertake necessary specialist studies;
 - Assessment of environmental impacts;
 - Compilation of management plans;
 - Compilation of an EMP Report;
 - Stakeholder document review and comment;
 - Submission of final report for decision-making.

The EMPr Report includes a description of the proposed project, a list of identified environmental and social aspects that will potentially be impacted upon by the proposed mining project, and impact assessment for these aspects, and environment management programme for the mitigation and management of the identified impacts.



18 MEASURES TO AVOID, REVERSE, MITIGATE, OR MANAGE IDENTIFIED IMPACTS AND TO DETERMINE THE EXTENT OF THE RESIDUAL RISKS THAT NEED TO BE MANAGED AND MONITORED.

Activity	POTENTIAL IMPACT	MITIGATION TYPE	POTENTIAL FOR RESIDUAL RISK
Opencast Mining	Dangerous excavations	Control access to the site	Low
	Loss of land capability	Remedy the area as close as possible to original land use	Low – Medium
	Impact on geology	Mine within demarcated areas only	High
	Less water reaching the surface water resource	Control storm water	Medium
	Influx of groundwater into mine workings	Control through pumping of water	Low
	Impact on external users' boreholes	Control through monitoring	Low-Medium
	Impact on mine water quality	Control through monitoring	Low
	Fugitive dust	Control through dust suppression	Low
	Daytime Noise Impact	Control through noise control	Low-Medium
	Night time Noise Impact	Control through noise control	Medium
	Alter overall landscape	Control through vegetated screens/berms	Low – Medium
	Lighting during night time	Control lighting during night times	Low – Medium
	Destruction of heritage or cultural aspects	Control through fencing and demarcations	Low-Medium
Phased approach	Impact on geology	Mine within demarcated areas only	High
	Soil erosion	Control through management	Low – Medium
	Sterilization of topsoil layer	Modify fertility of the soils	High
Blasting	Impact on habitat for floral species	Control area of disturbance	Low
	Impact on important species	Control through establishment of nursery	Low
	Loss of faunal habitat	Control buffer zones	Low
	Impacts on RDL species	Modify through training of personnel	Low
	Impact on availability of groundwater	Control through pumping of water	Low
	Impact on groundwater quality	Control seepage and runoff	Low
	Fugitive dust	Control through dust suppression	Low
	Daytime noise impact	Control through noise control	Low-Medium
	Impact on geology	Mine within demarcated areas only	High
Destruction of heritage or cultural aspects	Control through fencing and demarcations	Low-Medium	



Activity	POTENTIAL IMPACT	MITIGATION TYPE	POTENTIAL FOR RESIDUAL RISK
Waste rock stockpiling	Impact on geology	Mine within demarcated areas only	High
	Soil compaction	Control area of disturbance	Medium-High
	Soil erosion	Control through management	Low – Medium
	Sterilization of topsoil layer	Modify fertility of the soils	High
	Less water reaching the surface water resource	Control storm water	Medium
	Deterioration in water quality	Control pollution sources	Low-Medium
	Impact on groundwater quality	Control seepage and runoff	Low
	Fugitive dust	Control through dust suppression	Low
	Daytime noise impact	Control through noise control	Low-Medium
	Alter overall landscape	Control through vegetated screens/berms	Low – Medium
Temporary Topsoil storage	Impact on geology	Mine within demarcated areas only	High
	Soil compaction	Control area of disturbance	Medium-High
	Soil erosion	Control through management	Low – Medium
	Sterilization of topsoil layer	Modify fertility of the soils	High
	Deterioration in water quality	Control pollution sources	Low-Medium
	Less water reaching the surface water resource	Control storm water	Medium
	Impact on groundwater quality	Control seepage and runoff	Low
	Fugitive dust	Control through dust suppression	Low
	Daytime noise impact	Control through noise control	Low-Medium
	Alter overall landscape	Control through vegetated screens/berms	Low – Medium
Temporary overburden stockpiles loading	Impact on geology	Mine within demarcated areas only	High
	Soil compaction	Control area of disturbance	Medium-High
	Soil erosion	Control through management	Low – Medium
	Sterilization of topsoil layer	Modify fertility of the soils	High
	Deterioration in water quality	Control pollution sources	Low-Medium
	Less water reaching the surface water resource	Control storm water	Medium
	Impact on groundwater quality	Control seepage and runoff	Low
	Fugitive dust	Control through dust suppression	Low



Activity	POTENTIAL IMPACT	MITIGATION TYPE	POTENTIAL FOR RESIDUAL RISK
	Daytime noise impact	Control through noise control	Low-Medium
	Alter overall landscape	Control through vegetated screens/berms	Low – Medium
Loading	Chemical soil pollution	Control through the installation of subsoil drains	Low
	Soil compaction	Control area of disturbance	Medium-High
	Sterilization of topsoil layer	Modify fertility of the soils	High
	Deterioration in water quality	Control pollution sources	Low-Medium
	Less water reaching the surface water resource	Control storm water	Medium
	Fugitive dust	Control through dust suppression	Low
	Daytime noise impact	Control through noise control	Low-Medium
	Night time noise impact	Control through noise control	Medium
	Lighting during night time	Control lighting during night times	Low – Medium
Hauling and Transporting	Chemical soil pollution	Control through the installation of subsoil drains	Low
	Soil compaction	Control area of disturbance	Medium-High
	Sterilization of topsoil layer	Modify fertility of the soils	High
	Impact on important species	Control through establishment of nursery	Low
	Impact on habitat for floral species	Control area of disturbance	Low
	Loss of faunal habitat	Control buffer zones	Low
	Impacts on RDL species	Modify through training of personnel	Low
	Deterioration in water quality	Control pollution sources	Low-Medium
	Fugitive dust	Control through dust suppression	Low
	Daytime noise impact	Control through noise control	Low-Medium
	Night time noise impact	Control through noise control	Medium
	Lighting during night time	Control lighting during night times	Low – Medium
	Destruction of heritage or cultural aspects	Control through fencing and demarcations	Low-Medium
Road construction	Dangerous excavations	Control access to the site	Low
	Soil compaction	Control area of disturbance	Medium-High
	Soil erosion	Control through management	Low – Medium
	Sterilization of topsoil layer	Modify fertility of the soils	High



Activity	POTENTIAL IMPACT	MITIGATION TYPE	POTENTIAL FOR RESIDUAL RISK
	Chemical soil pollution	Control through the installation of subsoil drains	Low
	Impact on habitat for floral species	Control area of disturbance	Low
	Impact on important species	Control through establishment of nursery	Low
	Loss of faunal habitat	Control buffer zones	Low
	Impacts on RDL species	Modify through training of personnel	Low
	Loss of wetland habitat and structure	Control buffer zones	Medium – High
	Less water reaching the surface water resource	Control storm water	Medium
	Alteration of drainage patterns	Control storm water	Low-Medium
	Deterioration in water quality	Control pollution sources	Low-Medium
	Impact on groundwater quality	Control seepage and runoff	Low
	Fugitive dust	Control through dust suppression	Low
	Daytime noise impact	Control through noise control	Low-Medium
	Night time noise impact	Control through noise control	Medium
	Lighting during night time	Control lighting during night times	Low – Medium
	Destruction of heritage or cultural aspects	Control through fencing and demarcations	Low-Medium
Water abstraction from opencast	Influx of groundwater into mine workings	Control through pumping of water	Low
	Reduction in resources	Control through training and awareness	Low
	Impact on external users' boreholes	Control through monitoring	Low-Medium
Dust suppression	Soil erosion	Control through management	Low - Medium
	Deterioration in water quality	Control pollution sources	Low-Medium
	Impact on availability of groundwater	Control through pumping of water	Low
	Impact on groundwater quality	Control seepage and runoff	Low
	Fugitive dust	Control through dust suppression	Low
Removal of indigenous vegetation	Impact on habitat for floral species	Control area of disturbance	Low
	Impact on important species	Control through establishment of nursery	Low
	Loss of wetland habitat and structure	Control buffer zones	Medium – High
	Alter overall landscape	Control through vegetated screens/berms	Low – Medium
Administration and office	Dangerous excavations	Control access to the site	Low



Activity	POTENTIAL IMPACT	MITIGATION TYPE	POTENTIAL FOR RESIDUAL RISK
buildings	Soil compaction	Control area of disturbance	Medium-High
	Sterilization of topsoil layer	Modify fertility of the soils	High
	Chemical soil pollution	Control through the installation of subsoil drains	Low
	Loss of faunal habitat	Control buffer zones	Low
	Impacts on RDL species	Modify through training of personnel	Low
	Less water reaching the surface water resource	Control storm water	Medium
	Deterioration in water quality	Control pollution sources	Low-Medium
	Reduction in resources	Control through training and awareness	Low
	Daytime noise impact	Control through noise control	Low-Medium
	Night time noise impact	Control through noise control	Medium
	Alter overall landscape	Control through vegetated screens/berms	Low – Medium
	Lighting during night time	Control lighting during night times	Low – Medium
Workshops & Change Houses	Dangerous excavations	Control access to the site	Low
	Soil compaction	Control area of disturbance	Medium-High
	Sterilization of topsoil layer	Modify fertility of the soils	High
	Chemical soil pollution	Control through the installation of subsoil drains	Low
	Loss of faunal habitat	Control buffer zones	Low
	Impacts on RDL species	Modify through training of personnel	Low
	Less water reaching the surface water resource	Control storm water	Medium
	Deterioration in water quality	Control pollution sources	Low-Medium
	Reduction in resources	Control through training and awareness	Low
	Daytime noise impact	Control through noise control	Low-Medium
	Night time noise impact	Control through noise control	Medium
	Alter overall landscape	Control through vegetated screens/berms	Low – Medium
Lighting during night time	Control lighting during night times	Low – Medium	
On site sanitation	Dangerous excavations	Control access to the site	Low
	Soil compaction	Control area of disturbance	Medium-High
	Chemical soil pollution	Control through the installation of subsoil drains	Low



Activity	POTENTIAL IMPACT	MITIGATION TYPE	POTENTIAL FOR RESIDUAL RISK
	Loss of wetland habitat and structure	Control buffer zones	Medium – High
	Less water reaching the surface water resource	Control storm water	Medium
	Deterioration in water quality	Control pollution sources	Low-Medium
	Reduction in resources	Control through training and awareness	Low
	Impact on groundwater quality	Control seepage and runoff	Low
	Impact on external users' boreholes	Control through monitoring	Low-Medium
Diesel storage	Deterioration in water quality	Control pollution sources	Low-Medium
	Reduction in resources	Control through training and awareness	Low
	Impact on groundwater quality	Control seepage and runoff	Low
Product stockpiling	Sterilization of topsoil layer	Modify fertility of the soils	High
	Soil compaction	Control area of disturbance	Medium-High
	Deterioration in water quality	Control pollution sources	Low-Medium
	Reduction in resources	Control through training and awareness	Low
	Less water reaching the surface water resource	Control storm water	Medium
	Impact on groundwater quality	Control seepage and runoff	Low
Wash plant	Fugitive dust	Control through dust suppression	Low
	Soil compaction	Control area of disturbance	Medium - High
	Fugitive dust	Control through dust suppression	Low
	Daytime noise impact	Control through noise control	Low
	Night time noise impact	Control through noise control	Low
	Deterioration in surface water quality	Control pollution sources	Low-Medium
Deterioration in groundwater quality	Control pollution sources	Low-Medium	



19 OTHER INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

19.1 Impact on the socio-economic conditions of any directly affected person

This information will be updated following completion of the stakeholder engagement process for the Scoping Phase. A Socio-economic Impact Assessment specialist study will be undertaken as part of the EIA process. Additional information required by the competent authority as well as commenting authorities will be included in the EIA Report.

19.2 Impact on any National Estate referred to in Section 3(2) of the National Heritage Act

The impact on any National Estate will be included in the EIA Report following the completion of the archaeological, cultural and heritage specialist impact assessment.

19.3 Other Matters required in terms of Section 24(4)(a) and (b) of the Act

No specialist studies have been undertaken for the Proposed Project in order to assist with the location of the site layout during the Scoping Phase of the project. Furthermore, an engineered site layout has not yet been developed for the project. A number of alternatives are being investigated – no motivation is required in terms of sub-regulation 22(2)h. This will be compiled during the EIA Phase of the project.



20 UNDERTAKING REGARDING CORRECTNESS OF INFORMATION

I, Nicole Upton, herewith undertake that the information provided in the foregoing report is correct, and that the comments and inputs from stakeholders and Interested and Affected parties has been correctly recorded in the report.



Signature of the EAP

DATE: 15 September 2020

21 UNDERTAKING REGARDING LEVEL OF INFORMATION

I, Nicole Upton, herewith undertake that the information provided in the foregoing report is correct, and that the level of agreement with Interested and Affected parties and stakeholders has been correctly recorded and reported herein.



Signature of the EAP

DATE: 15 September 2020

- END -

