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Sefateng Chrome Mine – Zwartkoppies Scope of Work: Sampling Services

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1. Introduction and Background

1.1. Project Site Background

Sefateng Chrome Mine is an operating underground chrome mine, currently producing approximately 60 000 tonnes of ore per month. The underground mine has been in construction and production build-up phase since 2021, after completion of feasibility studies and depletion of open cast resources.

Sefateng Chrome Mine requires the services of a reputable sampling and analytical services provider for quality monitoring of the Run-of Mine (ROM) ore, chrome concentrate product, wash plant tailings, and all related products and/or discard generated along the mining value chain, as an integral part of the grade control, quality monitoring and ore accounting protocols for the mining and wash plant operations, as well as the quality tracking from mine to port for export purposes.

1.2. Locality and History

Sefateng Chrome Mine is located on the farm Zwartkoppies 413KS, which is situated approximately 90 km (by road) southeast of Polokwane, the capital of the Limpopo Province, approximately 58 km (by road) northwest of Burgersfort, and 2 km southwest of the R37 provincial road which links Polokwane to Nelspruit via Burgersfort and Lydenburg. Zwartkoppies 413KS is located on the administrative border between the Greater Tubatse and Fetakgomo Local Municipalities (part of the Greater Sekhukhune District Municipality).

The project site is located on the Sefateng Chrome Mine (Pty) Ltd Mining Right (LP30/5/2/1/10062MR) which encompasses the parts of the farms Zwartkoppies 413KS and Waterkop 113KT to the southwest of the R37.

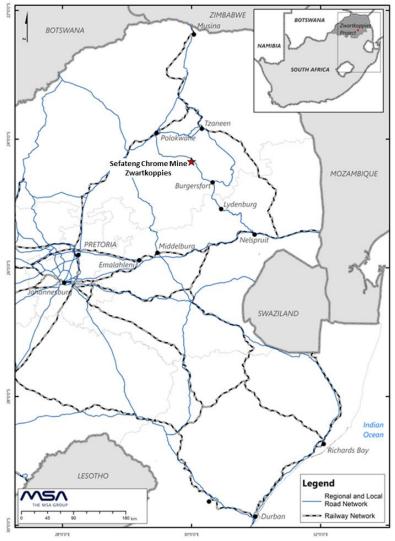


Figure 1: Locality of Sefateng Chrome Mine.





1.3. Geology and Mineralisation Overview

Sefateng Chrome Mine is located in the northern part of the Eastern Limb of the Bushveld Complex. The target horizon is the LG6 chromitite layer of the Lower Critical Zone of the Rustenburg Layered Suite (RLS). In the project area, the LG6 comprises a chromitite package composed of the lower LG6 chromitite layer (Steelpoort Seam) overlain by the LG6A chromitite layer. The two chromitite layers are separated by a pyroxenite middling often referred to as the LG6 Parting.

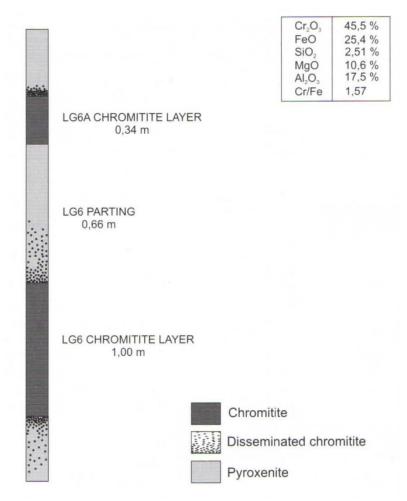


Figure 2: Generalised geological section of the LG6 chromitite layer.

The disseminated chromite zone, just above the top contact of the LG6, is 0.25 m thick and grades from a chromite-rich pyroxenite just above the contact to a feldspathic pyroxenite further up. A similar, 8 cm zone with disseminated chromite occurs in the immediate hanging wall of the LG6A. Another disseminated zone, averaging 0.27 m in thickness, is developed in the immediate footwall to the LG6 and may contain between 40 % and 60 % interstitial chromite.

The LG6 chromitite is generally friable in nature, with some patches of 'hard lumpy' throughout the eastern Bushveld Complex. It comprises an accumulate-type coarse-granular chromite which constitutes 97 % of the rock, with orthopyroxene, clinopyroxene, plagioclase and other minor accessory minerals making up the remaining 3 %. The chromite grains generally vary in size from 53 µm to 2 mm.

2. Run of Mine re Production Overview

2.1. Mining Method and Production Schedule

The underground mining operations produce ROM ore from a combination of mechanised, on-reef development, and conventional stoping. Sources of ROM product are:







- i) Stoping ore mining of LG6 only, aimed at ROM ore production of >38.0% Cr₂O₃. Cr:Fe typical > ca. 1.50
- ii) Development ore mining of LG6 and LG6A, along with parting and footwall waste, aimed at ROM ore production of >27.0% Cr₂O₃. Cr:Fe typical ca. 1.50

Current production rates:

- i) Stoping ore 40 000 tonnes per month.
- ii) Development ore 20 000 tonnes per month.

A total ROM production of 60 000 tonnes per month is currently maintained, with mine production planned to build up to 85 000 tonnes per month over the next 12 months.

ROM production quality is sampled at the ROM pad on surface. Routine sampling underground is not done, due to the highly consistent and continuous nature of the LG6 orebody. Ad-hoc underground sampling campaigns are conducted by mine staff, mainly for validation of sweepings / vamping ore grade, or other ad-hoc requirements. These samples will also be analysed by the appointed laboratory services provider for quality verification.

2.2. Wash Plant and Chrome Concentrate Production

The current wash plant capacity is 40 000 tonnes per month of ROM infeed, with chrome concentrate production of around 30 000 tonnes per month. The planning and construction of additional plant capacity is in progress, which will increase the plant infeed capacity to 80 000 tonnes per month by mid-2025, aligning the mine production volumes and plant infeed volumes for the long term.

Both chrome concentrate and ROM chrome ore products are marketed and sold for revenue generation. Sampling and analysis for quality monitoring is done throughout the process, including ROM ore infeed to the wash plant, concentrate export stockpiles, ROM export stockpiles, truck dispatch to port, etc. More detail is provided in the responsibility matrix (Annexure 1).

2.3. Site Layout and Infrastructure

An overview of the site layout is provided in Figure 3 for reference and orientation. The following features and items are to be noted:

- i) The main decline conveyor belt (DC-01) transfers ROM ore from the underground workings to surface. Rock hoisting is conducted over 3 shifts per day, on a 5-day work week shift roster. Weekend hoisting is also conducted as required to meet production targets.
- ii) A transfer bin and scalping screen is installed at the end of DC-01. Waste rocks are scalped off and tipped onto the waste rock dump (WRD), whereas the ROM ore is transported along the SC-01 surface conveyor (400m long) to the ROM pad.
- iii) A slewing conveyor is installed at the end of SC-01 to allow for creation of separate stockpiles per shift. This is the first and main sampling point for ROM stockpiles. ROM stockpiles are moved to the ROM pad after each shift and sampled per truck load as they are moved to a temporary position on the ROM pad, to await analytical results required for determining the final stockpile destination. It is proposed that an automatic cross-belt sampler be installed to obtain a more representative sample of each batch of ROM material produced per shift.
- iv) The wash plant is located next to the ROM pad. Plant infeed stockpiles are created by material type, aimed at a pre-determined infeed grade. Sampling of the infeed stockpiles are done in the same manner as for the ROM stockpiles, to obtain a composite grade for the infeed stockpiles, typically in batches of 10 000 tonnes or more.
- v) At the wash plant, it is expected that crusher infeed material will be sampled, to verify quality and compare with that of the infeed stockpile. Crushed and screened material will be sampled at agreed points in the wash plant circuit, followed by sampling of the chrome concentrate and tailings.
- vi) During final blending and completion of chrome concentrate stockpiles, the blended concentrate stockpiles will be sampled and analysed to confirm that the quality meets export specifications. Concentrate stockpiles







will typically be batched in sub-lots ranging from 1 000 tonnes to 4 000 tonnes, and then composited in port again to create 10 000 tonne lots as per shipping orders.

- vii) Tailings produced by the wash plant are sampled at the wet tailings stream. Tailings will be sampled again upon deposition at the dry tailings' storage facilities (TSF1 and TSF2). There are two types of tailings material to be sampled and reported, i.e. the tailings sand (1) and the PGM tailings mud (2).
- viii) ROM export stockpiles are created by blending suitable ROM stoping stockpiles in batches of 10 000 tonnes. Sampling of these stockpiles during blending is required to ensure that the quality of the export product meets the export specifications.
- ix) The area allocated for the on-site sample preparation and laboratory facility is indicated on the map, labelled as "Lab". An area of 25m x 12m has been proposed, which should be sufficient space to cast a concrete slab, place shipping containers and construct roofing to accommodate all sample preparation and laboratory equipment.
- x) There is a weighbridge situated at Gate 2. All concentrate product and ROM export product is sampled upon dispatch, by taking a sample for each FEL scoop placed on a truck. The grade is reported and composited per truck load and per order, to keep track of the product quality sent to port. Tagging and sealing of each truck is done at the weighbridge by the sampling inspector.

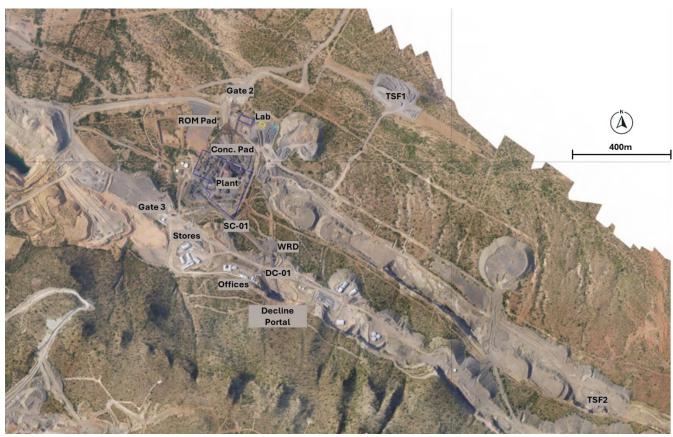


Figure 3: General Site Layout & Infrastructure Map.

3. General Description of the Services Requirements

3.1. Employer Responsibilities

Refer to Schedule of Responsibilities as per Annexure 1.

3.2. Contractor Responsibilities

Refer to Schedule of Responsibilities as per Annexure 1. Based on the process flow, volumes of material and sampling points, the Contractor must propose a suitable detailed sampling plan, including sampling frequency,







sample sizes, total number of samples, compositing and quality control. The contractor must make allowance in his pricing for:

- a. The total bills of materials and consumables, including all equipment as may be necessary to successfully execute the scope of work. The required area will be made available by Sefateng Chrome Mine for the Contractor to construct a suitable sample preparation and laboratory facility.
- b. The management and supervision of employees and any sub-contractors.
- c. The detailed designs, specifications, construction, installation, and maintenance of all facilities, equipment and services.
- d. The provision of detailed designs and contractor's recourses, including labour, materials, consumables and all major equipment needed to commission the facility and conduct the daily work activities required.
- e. The sourcing, provision and operation of an automatic cross-belt sampler on the SC-01 conveyor belt.

3.3. Project Areas and Services Covered in the Scope of Work

The Scope of Work document provides a general description of the mine and plant site layout, the facilities that are available and the requirements that are to be fulfilled by the contractor. The SoW includes various geographical areas, as well as the construction and / or installation work related to the sample preparation and laboratory facility. An overview of the project areas included in the Scope of Work are shown in Figure 4.



Figure 4: Project Areas included in the Scope of Work.

Project areas included in the Scope of Work on the Sefateng Chrome Mine site are shown in Figure 4, including:







- a. Sample Preparation and Analysis Facility (Laboratory) to be constructed and commissioned. The Laboratory service must include a Sample Preparation area, XRF (X-ray Fluorescence) and ICP-OES (Inductively Coupled Plasma-Optical Emission Spectroscopy) or Wet Chemistry Titration. Main elements of interest for analysis include Cr₂O₃, FeO, SiO₂, Moisture and Cr:Fe. Particle Size Distribution analysis will also be required in intervals as agreed and altered from time to time.
- b. ROM Stock Yard sampling and inspection.
- c. Wash Plant area sampling and inspection.
- d. Concentrate Stock Pad sampling and inspection.
- e. Weighbridge sampling and inspection.
- f. Automatic cross-belt sampler to be installed on the SC-01 conveyor belt.

In addition to the on-mine sampling and inspection activities required, the Contractor will also be responsible for the inspection of trucks leaving the mine and arriving in the port facility situated in Maputo. ROM ore and concentrate stockpiles delivered to port shall be inspected and sampled in order to verify product quality prior to shipping, and analytical reports shall be provided for comparison between on-mine results and in-port results.

4. Detailed Description of Works

4.1. Site Establishment and Construction of Facilities

A suitable area in the stock yard has been identified and allocated to the proposed on-site sample preparation and analysis facility, marked in yellow and labelled as "Lab" in Figure 5. The allocated area is 25m by 12m and could be increased somewhat, should this be required. The Contractor must make provision for casting of a suitable concrete slab in the allocated area, along with appropriate roofing structures and shipping containers for housing of the equipment and instruments. Any administrative office space for on-site personnel must be provided in this area. The main electrical power and water connection points to this facility will be provided by the Employer. Ablution facilities are available on site within walking distance.



Figure 5: Proposed location of sample preparation and laboratory facility.





4.2. Health, Safety and Environment

All general safety standards must apply to maintain a safe working environment. The contractor shall comply with the provisions of the Mine Health & Safety Act No. 26 of 1996 and Regulations and all relevant Codes of Practice and Safe Operating Procedures of Sefateng Chrome Mine. The Contractor shall provide a comprehensive Safety File for their operations and activities.

4.3. Accreditations and Certifications

SANAS accreditation, with specific inclusion of ISO/IEC 17025 and ISO/IEC 17020 accreditation is the minimum compliance requirement for sampling, inspection and laboratory services to Sefateng Chrome Mine. The Contractor shall make provision for the relevant certifications and accreditations of the on-site facilities and provide proof of all such accreditations and certifications to the Employer, along with timelines for accreditations to be obtained after inception of services.

4.4. Sampling and Inspection Activities

The on-site sampling and inspection points include:

- i) The slewing conveyor is installed at the end of SC-01 creating separate ROM ore stockpiles per shift. This is the first and main sampling point for ROM stockpiles. ROM stockpiles are moved to the ROM pad after each shift and sampled per truck load as they are moved to a temporary position on the ROM pad, to await analytical results required for determining the final stockpile destination. It is proposed that an automatic cross-belt sampler be installed to obtain a more representative sample of each batch of ROM material produced per shift.
- ii) The wash plant is located next to the ROM pad. Plant infeed stockpiles are created by material type, aimed at a pre-determined infeed grade. Sampling of the infeed stockpiles are done in the same manner as for the ROM stockpiles, to obtain a composite grade for the infeed stockpiles, typically in batches of 10 000 tonnes or more.
- iii) At the wash plant, it is expected that crusher infeed material will be sampled, to verify quality and compare with that of the infeed stockpile. Crushed and screened material will be sampled at agreed points in the wash plant circuit, followed by sampling of the chrome concentrate and tailings.
- iv) During final blending and completion of chrome concentrate stockpiles, the blended concentrate stockpiles will be sampled and analysed to confirm that the quality meets export specifications. Concentrate stockpiles will typically be batched in sub-lots ranging from 1 000 tonnes to 4 000 tonnes, and then composited in port again to create 10 000 tonne lots as per shipping orders.
- v) Tailings produced by the wash plant are sampled at the wet tailings stream. Tailings will be sampled again upon deposition at the dry tailings' storage facilities (TSF1 and TSF2). There are two types of tailings material to be sampled and reported, i.e. the tailings sand (1) and the PGM tailings mud (2).
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In addition to the on-mine sampling and inspection activities required, the Contractor will also be responsible for the inspection and sealing of trucks leaving the mine and arriving in the port facility situated in Maputo. ROM ore and concentrate stockpiles delivered to port shall be inspected and sampled in order to verify product quality prior to shipping, and analytical reports shall be provided for comparison between on-mine results and in-port results.

Based on the process flow, volumes of material and sampling points, the Contractor must propose a suitable detailed sampling plan, including sampling frequency, sample sizes, total number of samples, compositing and quality control measures, to be presented as a methodology statement to the Employer, for consideration. Tender pricing must be aligned with the proposed sampling plan.





4.5. Analytical Services

The Laboratory service must include a Sample Preparation area, XRF (X-ray Fluorescence) and ICP-OES (Inductively Coupled Plasma-Optical Emission Spectroscopy) or Wet Chemistry Titration. Main elements of interest for analysis include Cr₂O₃, FeO, SiO₂, Moisture and Cr:Fe. Particle Size Distribution analysis will also be required in intervals as agreed and altered from time to time. The proposed analysis types and frequency thereof must be described in the method statement proposed by the Contractor.

Turnaround times are critical to the success of the operations. All analytical results are required to be delivered within 24 hours from sampling being conducted. Sampling will be conducted immediately upon completion of each shift for ROM stockpiles, and as per descriptions and timelines discussed in the sampling activities and areas in the services description section of this scope of work documents.

Reporting standards and timelines shall be specified and agreed upon between the Employer and the Contractor, in a format and layout suitable for analysis and decision-making. Certificates of Analysis shall be required for monthly production of ROM ore, as well as all export stockpiles and consignments.

5. Equipment Requirements and Maintenance

The contractor will make provisions in his pricing for the supply, certification, calibration and maintenance of all sample preparation and analytical equipment that may be deemed necessary for the successful execution of the Scope of Work. The Laboratory service must include a Sample Preparation area, XRF (X-ray Fluorescence) and ICP-OES (Inductively Coupled Plasma-Optical Emission Spectroscopy) or Wet Chemistry Titration. Main elements of interest for analysis include Cr₂O₃, FeO, SiO₂, Moisture and Cr:Fe. Particle Size Distribution analysis will also be required in intervals as agreed upon and altered from time to time. An automatic cross-belt sampler to be installed on the SC-01 conveyor belt.

6. Logistical Services and Transport

6.1. Materials

The contractor will make provision for the collection and transportation of his materials and consumables to Sefateng Chrome Mine.

6.2. Personnel

The contractor shall make provisions to transport of employees to and from the place of work. The contractor must make provision for an on-site vehicle (LDV) for personnel and sample transportation between the various sampling points and the on-site laboratory area.

7. Hours of Work

7.1. Basic Conditions of Employment

- a. Hours of work shall be within statutory requirements.
- b. The contractor must make provisions in his estimate for a system of work to enable a work cycle that will allow for sampling services to be conducted 24 hours per day, 7 days per week. This is critical to align with the production outputs and material movements within the stockpile and plant areas.
- c. The contractor shall disclose to the employer his detailed labour plan.

8. Program and Planning



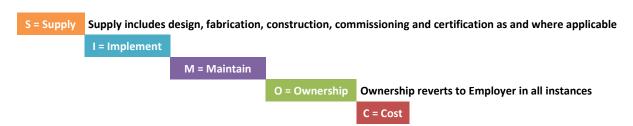




8.1. The contractor shall provide a comprehensive project programme and schedule stipulating the milestones and deliverables of the project activities for the various construction and commissioning phases, as well as implementation of relevant services.

9. Annexures

Annexure 1 Schedule of Responsibilities



		EMPLOYER							сто	R		
RESPONSIBILITY MATRIX	s	1	М	0	С	s	ı	М	0	С	COMMENTS	
INSURANCES												
Buildings, Machinery and Equipment						х	х	х	х	х		
Workers Compensation Insurance						х	х	х	х	х		
Public & Product Liability						х	х	х	х	х		
Motor Vehicle Liability						х	х	х	х	х		
Motor Vehicle Third Party Liability						х	х	х	х	х		
STATUTORY MANAGEMENT & SUPERVISION APPLIC	CABLE											
Technical Services Manager	х										MHSA Reg 2.6.1	
Mineral Resource Manager	х										MHSA Reg 2.6.1	
Engineering Manager	х										MHSA Reg 2.13.1	
Surface Logistics Manager	х										MHSA Reg 2.6.1	
Safety Officer	х										MHSA Reg 2.17.1	
Safety Representatives						х	х	х		х	MHSA 2.18.1	
First Aider						х	х	х		х	MHSA 24.7	
CONTRACTOR PERSONNEL												
Site Manager						х	х	х	х	х		
Administration						х	х	х	х	х		
Site Supervisors						х	х	х	х	х		
Inspectors						х	х	х	х	х		
Samplers						х	х	х	х	х		
General Labourers						х	х	х	х	х		
Instrument Technicians						х	х	х	х	х		
REPORTING												
Capture of Daily Data						х	х	х	х	х		
Daily Report						х	х	х	х	х		
Monthly Report						х	х	х	х	х	Including certificates.	







		ΕM	PLO	ΥFR			ON	TRAG	CTO	R	MINING
RESPONSIBILITY MATRIX	S	v.		0	С			М		C	COMMENTS
WATER SUPPLY (PROCESS & POTABLE)											
Connection point to main water lines	х	х	х	х	х						
Plumbing and distribution within laboratory area						х	х	Х	х	х	
POWER / ELECTRICAL		<u> </u>			ļ	<u> </u>					
Connection point to main power supply	х	х	х	х	х						
Distribution within laboratory area						х	х	х	х	х	
MEETINGS											
Shift Meeting							х	х			
Daily Meeting							х	х			
Weekly Meeting							х	х			
Monthly Contract Meeting		х	х								
COMMUNICATIONS											
Vehicle Mounted Radios		х	х			х		х	х	х	
Handheld Radios		х	х			х		х	Х	х	
Mobile Telephones						х	х	х	х	х	
Surface Data Communication	х	х	х	х	х						
EQUIPMENT, INSTRUMENTS & VEHICLES											
Sampling Equipment and Consumables						х	х	х	х	х	
Sample Preparation Equipment						х	х	х	х	х	
Analytical Equipment & Instruments						х	х	х	х	х	
Automatic Belt Sampler on SC-01		х		х		х	х	х		х	Ownership to transfer to Employer
LDV – Surface						х	х	х	х	х	
SAFETY											
Pre-Employment Clearances						х					
Pre-Employment Medicals	х									х	
Site Induction	х									х	
Training	х									х	
Operator Competency Certification						х		х			
Personal Protective Equipment ["PPE"]						х	х	х	х	х	
Ambulance	х										
Medic / Paramedic	х										
First-Aid Centre	х										
First-Aid Equipment	х					х	х	х	Х	х	
Stretchers	х					х	х	х	х	х	
Safety Signage	х					х	х	х	х	х	
MANAGEMENT SYSTEMS											
Safety Management Plan	х	х	х				х		х		
Fatigue Management Plan	х	х	х				х		х		
Quality Management Plan	х	х	х				Х		х		







RESPONSIBILITY MATRIX		EM	PLO	YER	t	C	ON	TRA	сто	R	CONANAENITO
		ı	М	0	С	S	ı	М	o	С	COMMENTS
HR / IR Management Plan	х	х	х				х		х		
Emergency Response Plan	х	х	х				х		х		
INFRASTRUCTURE/ STRUCTURES											
Office						х	х	х	х	х	
Container(s): Sample Preparation, Analytical Instruments						х	х	х	х	х	
Ablutions	x	х	х	х	X						
Concrete Pad						х	х	х	х	х	
Steel Structure - Roofing						х	х	х	х	х	
SECURITY											
Mine Security Fencing & Access Control	х	х	х	х	х						
Security Lights	х	х	х	х	X						
Protection, Surveillance and Monitoring	x	х	х	х	X						
Lab Area & Containers						х	х	х	х	х	Security of lab equipment.
SERVICE PROVIDER ACCREDITATION											
SANAS Accreditation						х	х	х	х	х	
ISO/IEC17025 Accreditation						х	х	х	х	х	
ISO/IEC17020 Accreditation						х	х	х	х	х	
SAMPLING PROGRAMME & PROTOCOL											
Design, develop and implement sampling programme & protocols				х		х	х	х			Employer to oversee and approve.
Develop sampling and analysis standards & procedures				X		X	х	х			Employer to oversee and approve.