DRAFT SCOPING REPORT AND PLAN OF STUDY

SAMANCOR CHROME LIMITED (EASTERN CHROME MINES) MINING RIGHT, ENVIRONMENTAL AUTHORISATION AND WASTE MANAGEMENT LICENCE APPLICATION FOR THE PROPOSED MAREESBURG OPERATIONS, LIMPOPO PROVINCE

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Department of Mineral Resources and Energy

Limpopo Province Region

mineral resources
Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

DRAFT SCOPING REPORT AND PLAN OF STUDY FOR PUBLIC PARTICIPATION

FOR LISTED ACTIVITIES ASSOCIATED WITH THE PROPOSED SAMANCOR CHROME LIMITED (EASTERN CHROME MINES) MAREESBURG OPERATIONS, LIMPOPO PROVINCE.

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

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EXECUTIVE SUMMARY

Introduction

This Executive Summary provides a summary of the Draft Scoping Report compiled and distributed for review and comment as part of the Scoping and Environmental Impact Assessment (S&EIA) process that is being undertaken for an integrated Environmental Authorisation process at the Samancor Eastern Chrome Mines (ECM) Mareesburg mining areas.

Environmental Assurance (Pty) Ltd (ENVASS) as independent environmental consultants were appointed by the Samancor Chrome Limited's Eastern Chrome Mines (ECM) section to undertake the Mining Right (MR), Environmental Authorisation (EA), Waste Management Licence (WML) and Water Use Licence Application (WULA) for the proposed Mareesburg underground/opencast mining areas. These areas are located within the Sekhukhune District Municipality in the Limpopo Province.

Project Background

Mareesburg Chrome Mine comprises of the farm Mareesburg 8 JT situated in the Steelpoort area. This farm lies within the provincial boundaries of the Limpopo Province, and falls within the Sekhukhune District Municipality of the Limpopo Province, approximately 34km south-west of Steelpoort and 32km west of Lydenburg. The mineral/s that will be mined at Mareesburg 8 JT is the Middle Group (MG) chromite seams and in particular the MG0, MG1, MG2, MG3 and MG4 chromitite seams.

This application relates to an application for a new Mining Right in terms of the Mineral and Petroleum Resources Development Act, 2002, (Act no. 28 of 2002), for the following:

1. Opencast and underground mining of the MG0, MG1, MG2, MG3 and MG4 chromitite seams on the farm Mareesburg 8 JT.

2. Extraction and processing of Chrome Ore, PGMs and Associated Minerals (gold, silver, copper, nickel and cobalt) which may be extracted from normal mining of Chromite in the Middle Group (MG) Reefs.

In this application, Platinum Group Metals (PGMs) shall refer to Platinum, Palladium, Rhodium, Ruthenium, Iridium and Osmium.

Summary of activities

Table 1: Summary of proposed activities to take place at the proposed Mareesburg Mine

Project activity	Detail Description
Mining	
Target minerals	• Middle Group chromite seams

Project activity	Detail Description
Ore body	• MG0, MG1, MG2, MG3 and MG4 Chromitite seams.
Products	• Chrome Ore, Platinum Group Metals (PGMs) and associated minerals (gold, silver, copper, nickel and cobalt)
Mining method	• The mining method selected will be opencast due to the shallow nature of ore outcropping on surface and so as to make the ore available as early as possible.
	• Underground mine is planned at 60m - 300m below surface and would yield 960kt/a or 1.2Mt/a
	• Based on a steady state production rate of 80,000 to 100,000 tons of run of mine (ROM) ore per month. • Underground mining of the UG2 reef on the farm Mareesburg. Mining will be via three decline shaft system. • The mining method is described in further details in section 5.2.4.
Tonnages	• The mine will have a total production of 80 000 - 100 000 tonnes per month (tpm) for opencast mining activities and up to 100 000 tonnes per month for underground mining activities. The project phasing is described in further details in section 5.2.3 and section 5.2.4.
Operation period	• The mine will be operational 353 days per year, 24 hours per day for an estimated period of 24 years.
Process	
Plant	• The ore will be processed using spiral and dense media separation plants. • PGM Concentrates will be trucked to the Tweefontein via 30-50 tonne trucks for further processing.
Waste and residue disposal	
Rock dumps	• Waste dumps to be placed away from chrome sub-outcrop positions.
Tailings facilities	• The construction of a Tailings Storage Facility (TSF) is proposed in conjunction with the Plant • For details on the TSF, refer to Section 5.2.5.
Domestic waste disposal	• Domestic waste disposal will be undertaken by a waste management contractor to the registered local municipal landfill. • Details on waste disposal can be seen in Section 11.
Industrial waste disposal	• Site to measure 68 m x 55 m and will be fenced • All scrap metal to be separated and sold to scrap metal dealers • Wastes such as paper are to be sorted for recycling at source • Hazardous waste (incudes fluorescent tubes) is to be removed by an approved contractor and disposed offside by approved facility • Used tyres and oil are to be returned to suppliers/dealers for recycling and refining.
Other mine infrastructure	
Sewage plant	• A sewage treatment plant (footprint of 0.9 ha) with a capacity of 350 m^3 per day is proposed • Treated effluent will be contained in evaporation dam/ponds and be used for garden irrigation
Surface conveyors	• Surface conveyor would be constructed.
Roads	• Final location of roads to be constructed will be determined by specialist findings and recommendations to minimise impacts on the surrounding environment.
	• Trucks with a 30-50 tonne carrying capacity will be used to transport ore from the mine to stockpiles and from stockpiles to processing areas via the haul roads to be established

Project activity	Detail Description
Powerline	• Electricity supply from Eskom is derived from incoming supply points at 33kV, with an Eskom sub-station situated at the central area.
Transportation of people and materials	• Crushed ore will be transported from the site to the plant at Tweefontein mine. • Employees will be transported between labour sending areas to the mine either via private transportation or busses provided by the mine.
Water supply	• Currently ECM has an allocation from Lebalelo Water User Association (LWUA) of 7 Ml/day for the life of mine
	• Raw water will be supplied to the mine via an off-take from the Lebalelo pipeline. ECM is signatory to the LWUA's membership agreement, which constitutes a legal service agreement between ECM and LWUA. • Initially, supply to the mine will be via an abstraction borehole.

Summary Of Authorisation Requirements

The proposed project includes activities listed under both the of the National Environmental Management Act (NEMA) and waste management activities listed under the National Environmental Management Act (NEMWA), as amended. Under both NEMA and NEM:WA, activities are prohibited from commencing until written authorisation is obtained from the competent authority, which in this case is the Limpopo Province of the Department of Mineral Resources and Energy (DMRE). In terms of the Section 102 of the MPRDA, an EMPr may not be amended or varied without the written consent of the Minister of Mineral Resources. The MPRDA, NEMA and NEM:WA require that an applicant submit the relevant environmental reports required in terms of NEMA. The NEMA Environmental Impact Assessment (EIA) Regulations, 2014 (published under Government Notice Regulation (GNR) 982 of 4 December 2014, as amended) (hereafter referred to as NEMA EIA Regulations, (GNR 982 of 2014 as amended)), promulgated in terms of NEMA sets out the assessment process and reporting requirements where authorisation is required. The project requires an integrated environmental authorisation process and will be undertaken to meet the requirements of:

- Regulation 21 and 23 (S& EIA process) to cater for listed activities in terms of the NEMA EIA Regulations (GNR 982 of 2014, as amended).

A Water Use Licence application under Section 21 of NWA is also required from the competent authority, which in this case is the Mpumalanga Province office of the Department of Water and Sanitation (DWS).

Legislative Requirements

The following legal authorisation requirements have been identified in Table 2.

Table 2: Listed activities that are / may be applicable to the proposed development.

NAME OF ACTIVITY (All activities including activities not listed) (E.g. 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…etc…etc.)	LISTING NOTICE */NOT LISTED*	APPLICABILITY
CONSTRUCTION PHASE		
Clearing of vegetation and topsoil and excavation for the access and haul roads, pollution control dam footprint and opencast areas. Stockpiling of topsoil for rehabilitation purposes. Earthworks to excavate in preparation for mining and infrastructure construction. Stockpiling of overburden for later rehabilitation. Loading and hauling of topsoil and overburden to stockpiles respectively. Construction of infrastructure required including offices, workshops, ablution facilities, pipelines, power lines, conveyors, processing plant, power lines. Construction of Diesel Storage Tanks. Drilling of abstraction and monitoring boreholes. Construction of water management infrastructure (water supply dams, stormwater control berms, PCD's, pipelines, channels).	**Listing Notice 1 (GNR 983) Activity 9** *The development of infrastructure exceeding 1 000 metres in length for the bulk transportation of water or storm water—* *(i) with an internal diameter of 0,36 metres or more; or* *(ii) with a peak throughput of 120 litres per second or more;* *excluding where—* *(a) such infrastructure is for bulk transportation of water or storm water or storm water drainage inside a road reserve or railway line reserve; or* *(b) where such development will occur within an urban area.* **Listing Notice 1 (GNR 983) Activity 10** *The development and related operation of infrastructure exceeding 1 000 metres in length for the bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes –* *(i) with an internal diameter of 0,36 metres or more; or* *(ii) with a peak throughput of 120 litres per second or more;* *excluding where—* *(a) such infrastructure is for the bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes inside a road reserve or railway line reserve; or* *(b) where such development will occur within an urban area.* **Listing Notice 1 (GNR 983) Activity 12** *The development of—* *(iii) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres; or*	These activities (clearing, earthworks, stockpiling, the construction of loading, hauling, water, hazardous material storage and other infrastructure, drilling, dust suppression, etc.) are applicable to the removal of indigenous vegetation for mining as well as the requirement of a WUL in terms of: • Section 21 (a): Taking of water from a water resource; • Section 21 (b): Storing water; • Section 21.(c): Impeding or diverting the flow of water in a watercourse; • Section 21 (e): Engaging in a controlled activity; • Section 21.(g): Disposing of waste in a manner which may detrimentally impact on a water resource; • Section 21.(i): Altering the bed, banks, course or characteristics of a watercourse.

NAME OF ACTIVITY (All activities including activities not listed) (E.g. 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…etc…etc.)	LISTING NOTICE */NOT LISTED*	APPLICABILITY
Construction of access and haul roads. Dust Suppression Construction of waste rock dumps and tailings storage facilities	*(iv) 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; —* *excluding—* *(aa) the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour;* *(bb) where such development activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies;* *(cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies;* *(dd) where such development occurs within an urban area;* *(ee) where such development occurs within existing roads, road reserves or railway line reserves; or* *(ff) the development of temporary infrastructure or structures where such infrastructure or structures will be removed within 6 weeks of the commencement of development and where indigenous vegetation will not be cleared.* **Listing Notice 1 (GNR 983) Activity 13** *The development of facilities or infrastructure for the off-stream storage of water, including dams and reservoirs, with a combined capacity of 50 000 cubic metres or more, unless such storage falls within the ambit of activity 16 in Listing Notice 2 of 2014.* **Listing Notice 1 (GNR 983) Activity 14**	• Section 21 (j): Removing, discharging or disposing water found underground if it is necessary for the efficient continuation of an activity or for the safety of people. The construction of the waste rock dumps and tailings facilities trigger activities in terms of NEMWA and require a WML for the following: **NEMWA GNR 921: Activity 10** *The construction of a facility for a waste management activity listed in Category B of this Schedule (not in isolation to associated waste management activity).* **NEMWA GNR 633. Activity 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*

NAME OF ACTIVITY (All activities including activities not listed) (E.g. 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…etc…etc.)	LISTING NOTICE */NOT LISTED*	APPLICABILITY
	The development and related operation of facilities or infrastructure, for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic metres. **Listing Notice 1 (GNR 983) Activity 24** *The development of a road—* *i. for which an environmental authorisation was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in Government Notice 545 of 2010; or* *ii. with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres;* *but excluding a road—* *a) which is identified and included in activity 27 in Listing Notice 2 of 2014;* b) *where the entire road falls within an urban area; or* c) *which is 1 kilometre or shorter.* **Listing Notice 2 (GNR 984) Activity 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, excluding-* *(i) Activities which are identified and included in Listing Notice 1 of 2014;* *(ii) Activities which are included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case the National Environmental Management: Waste Act, 2008 applies;*	*Development Act, 2002 (Act No. 28 of 2002).*

NAME OF ACTIVITY (All activities including activities not listed) (E.g. 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…etc…etc.)	LISTING NOTICE */NOT LISTED*	APPLICABILITY
	(iii) The development of facilities or infrastructure for the treatment of effluent, polluted water, wastewater or sewage where such facilities have a daily throughput capacity of 2 000 cubic metres or less; or *(iv) Where the development is directly related to aquaculture facilities or infrastructure where the wastewater discharge capacity will not exceed 50 cubic metres per day.* **Listing Notice 2 (GNR 984) Activity 15** *The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for—* *i. the undertaking of a linear activity; or* *ii. maintenance purposes undertaken in accordance with a maintenance management plan.* **Listing Notice 3 (GNR 985) Activity 4** *The development of a road wider than 4 metres with a reserve less than 13,5 metres.* ***e. Limpopo*** *i. Outside urban areas:* *(aa) A protected area identified in terms of NEMPAA, excluding disturbed areas;* *(bb) National Protected Area Expansion Strategy Focus areas;* *(cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;* *(dd) Sites or areas identified in terms of an international convention;* *(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;* *(ff) Core areas in biosphere reserves; or*	

NAME OF ACTIVITY (All activities including activities not listed) (E.g. 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…etc…etc.)	LISTING NOTICE */NOT LISTED*	APPLICABILITY
	(gg) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve, excluding disturbed areas **Listing Notice 3 (GNR 985) Activity 10** The development and related operation of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic metres. e. Limpopo i. All areas. **Listing Notice 3 (GNR 985) Activity 12e** *The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.* **e. Limpopo** *i. Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004;* *ii. Within critical biodiversity areas identified in bioregional plans; or* iii. *On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning.* **Listing Notice 3 (GNR 985) Activity 14e** *The development of-* *(i) Dams or weirs, where the dam or weir, including infrastructure and water surface area exceeds 10 square metres; or* *(ii) Infrastructure or structure with a physical footprint of 10 square metres or more:*	

NAME OF ACTIVITY (All activities including activities not listed) (E.g. 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…etc…etc.)	**LISTING NOTICE** ***/NOT LISTED***	**APPLICABILITY**
	Where such development occurs- *(a) Within a watercourse;* *(b) In front of a development setback; or* *(c) If no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse;* *Excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour.* ***e. Limpopo*** *i. Outside urban areas:* *(ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans.*	
OPERATIONAL PHASE		
Clearing of vegetation and topsoil by bulldozer/frontend-loader during opencast mining. Stockpiling of topsoil and overburden for later rehabilitation. Opencast mining using heavy duty earth moving equipment. Blasting.	**Listing Notice 1 (GNR 983) Activity 12** *The development of—* *(i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres; or* *(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; —* *excluding—*	These activities (clearing, earthworks, stockpiling, stockpiling for mining, the maintenance of loading, hauling, water, hazardous material storage and other infrastructure, dust suppression, blasting, mining, crushing, screening and washing etc.) are applicable to the removal of indigenous vegetation for mining as well as the requirement of a WUL in terms of: • Section 21 (a): Taking of water from a water resource; • Section 21 (b): Storing water;

NAME OF ACTIVITY (All activities including activities not listed) (E.g. 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…etc…etc.)	**LISTING NOTICE** ***/NOT LISTED***	**APPLICABILITY**
Stockpiling of ROM. Loading, hauling and transport by truck of ROM to stockpiles and processing plant. Crushing, screening and washing of ROM. Deposition of waste rock onto waste rock dump. Disposal of Tailings to RSF Maintenance of the PCD and other stormwater infrastructure. Dust Suppression	*(aa) the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour;* *(bb) where such development activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies;* *(cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies;* *(dd) where such development occurs within an urban area;* *(ee) where such development occurs within existing roads, road reserves or railway line reserves; or* *(ff) the development of temporary infrastructure or structures where such infrastructure or structures will be removed within 6 weeks of the commencement of development and where indigenous vegetation will not be cleared.* **Listing Notice 1 (GNR 983) Activity 19** *The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse;* *but excluding where such infilling, depositing, dredging, excavation, removal or moving—* *(a) will occur behind a development setback;* *(b) is for maintenance purposes undertaken in accordance with a maintenance management plan;* *(c) falls within the ambit of activity 21 in this Notice, in which case that activity applies;* *(d) occurs within existing ports or harbours that will not increase the development footprint of the port or harbour; or*	• Section 21.(c): Impeding or diverting the flow of water in a watercourse; • Section 21 (e): Engaging in a controlled activity; • Section 21.(g): Disposing of waste in a manner which may detrimentally impact on a water resource; • Section 21.(i): Altering the bed, banks, course or characteristics of a watercourse. • Section 21 (j): Removing, discharging or disposing water found underground if it is necessary for the efficient continuation of an activity or for the safety of people. The disposal of waste on the waste rock dumps and tailings facilities trigger activities in terms of NEMWA and require a WML for the following: **NEMWA GNR 633. Activity 11** *The establishment or reclamation of a residue stockpile or residue deposit*

NAME OF ACTIVITY (All activities including activities not listed) (E.g. 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…etc…etc.)	LISTING NOTICE */NOT LISTED*	APPLICABILITY
	where such development is related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies. **Listing Notice 2 (GNR 984) Activity 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, excluding-* *(i) Activities which are identified and included in Listing Notice 1 of 2014;* *(ii) Activities which are included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case the National Environmental Management: Waste Act, 2008 applies;* *(iii) The development of facilities or infrastructure for the treatment of effluent, polluted water, wastewater or sewage where such facilities have a daily throughput capacity of 2 000 cubic metres or less; or* *(iv) Where the development is directly related to aquaculture facilities or infrastructure where the wastewater discharge capacity will not exceed 50 cubic metres per day.* **Listing Notice 2 (GNR 984) Activity 15** *The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for—* *i. the undertaking of a linear activity; or* *ii. maintenance purposes undertaken in accordance with a maintenance management plan.* **Listing Notice 2 (GNR 984) Activity 17**	*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).*

NAME OF ACTIVITY (All activities including activities not listed) (E.g. 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…etc…etc.)	LISTING NOTICE */NOT LISTED*	APPLICABILITY
	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), including— *a) associated infrastructure, structures and earthworks, directly related to the extraction of a mineral resource; or* b) *the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing;* *but excluding the secondary processing of a mineral resource, including the smelting, beneficiation, reduction, refining, calcining or gasification of the mineral resource in which case activity 6 in this Notice applies.* **Listing Notice 3 (GNR 985) Activity 12e** *The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.* **e. Limpopo** *i. Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004;* *ii. Within critical biodiversity areas identified in bioregional plans; or* iii. *On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning.* **Listing Notice 3 (GNR 985) Activity 14e** *The development of-* *(i) Dams or weirs, where the dam or weir, including infrastructure and water surface area exceeds 10 square metres; or*	

NAME OF ACTIVITY (All activities including activities not listed) (E.g. 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…etc…etc.)	LISTING NOTICE */NOT LISTED*	APPLICABILITY
	(ii) Infrastructure or structure with a physical footprint of 10 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 has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse;* *Excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour.* ***e. Limpopo*** *i. Outside urban areas:* *(ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans.*	
DECOMMISSIONING, CLOSURE AND POST-CLOSURE PHASE		

NAME OF ACTIVITY (All activities including activities not listed) (E.g. 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…etc…etc.)	**LISTING NOTICE** ***/NOT LISTED***	**APPLICABILITY**
Backfilling and landscaping. Topsoil placement and reseeding concurrent rehabilitation. Monitoring of rehabilitated areas.	**Listing Notice 1 (GNR 983) Activity 19** *The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse;* *but excluding where such infilling, depositing, dredging, excavation, removal or moving—* *(a) will occur behind a development setback;* *(b) is for maintenance purposes undertaken in accordance with a maintenance management plan;* (c) *falls within the ambit of activity 21 in this Notice, in which case that activity applies;* *(d) occurs within existing ports or harbours that will not increase the development footprint of the port or harbour; or* *(e) where such development is related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies.* **Listing Notice 2 (GNR 984) Activity 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, excluding-* *(i) Activities which are identified and included in Listing Notice 1 of 2014;* *(ii) Activities which are included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case the National Environmental Management: Waste Act, 2008 applies;*	Rehabilitation activities taking place within a watercourse which require a WUL in terms of: • Section 21 (c) Impeding or diverting the flow of water in a watercourse; • Section 21 (i) Altering the bed, banks, course or characteristics of a watercourse;

NAME OF ACTIVITY (All activities including activities not listed) (E.g. 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…etc…etc.)	LISTING NOTICE */NOT LISTED*	APPLICABILITY
	(iii) The development of facilities or infrastructure for the treatment of effluent, polluted water, wastewater or sewage where such facilities have a daily throughput capacity of 2 000 cubic metres or less; or *(iv) Where the development is directly related to aquaculture facilities or infrastructure where the wastewater discharge capacity will not exceed 50 cubic metres per day* **Listing Notice 2 (GNR 984) Activity 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), including—* *c) associated infrastructure, structures and earthworks, directly related to the extraction of a mineral resource; or* d) *the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing;* *but excluding the secondary processing of a mineral resource, including the smelting, beneficiation, reduction, refining, calcining or gasification of the mineral resource in which case activity 6 in this Notice applies.*	

Alternatives

The following three (3) alternatives were investigated during the scoping phase as possible feasible alternatives:

- Mining the whole Mining Right Area with a Biodiversity Offset (preferred alternative);
- Exclusion of High Sensitivity areas as identified during specialist assessments;
- Not implementing the activities *(No – Go alternative).*

Need and Desirability

The benefits of the existing ECM Mareesburg Chrome Mining Operations can be summarized as:

- It contributes to the economic welfare of the surrounding community by retaining employment opportunities, in-house training to the regional population, education and housing assistance and medical and clinical facilities;
- It contributes to the upliftment of living standards and the health and safety of the local community through the provision of long-term employment opportunities.

The nett benefit to South Africa is a product produced for the world commodity market, contributing toward South African earnings necessary toward foreign exchange and capital investment needed for a healthy economy and for the long-term future of the country.

The project is reportedly aligned with the objectives of the municipal Spatial Development Framework (SDF) and Integrated Development Plan (IDP), which specifically highlights the development of the mining sector and contribution to the improvement of economies.

Public Participation

A Public Participation Process (PPP) is being undertaken for the proposed Mareesburg mining operation. This process is undertaken to ensure compliance with the associated requirements of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) [as amended] (MPRDA), the National Environmental Management Act, 1998 (Act No. 107 of 1998) [as amended] (NEMA), the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) [as amended], the National Water Act, 1998 (Act No. 36 of 1998) [as amended] (NWA) as well as the Environmental Impact Assessment Regulations (2014) [as amended].

The PPP for this project is earmarked by the following key initiatives, however not limited to these only:

- Identification of key interested and affected parties (affected and adjacent landowners) and other stakeholders (organs of state and other parties);

- Formal notification of the application to interested and affected parties (including all affected and adjacent landowners) and other stakeholders of the commenting period of 30 days on the Scoping and Plan of Study Reports as well as the EIA and EMPr Reports and associated documents;
- Public open day;
- Virtual Public Meeting; and
- Ongoing consultation and correspondence with I&APs, focus groups and other stakeholders.

EIA Screening Tool

The National Web based Environmental Screening Tool is a geographically based web-enabled application which allows a proponent intending to submit an application for environmental authorization in terms of the Environmental Impact Assessment Regulations (2014), to screen their proposed site for any environmental sensitivity.

The Screening Tool also provides site specific EIA process and review information, for example, the Screening Tool may identify if an industrial development zone, minimum information requirement, Environmental Management Framework or bio-regional plan applies to a specific area.

Further to this, the Screening Tool identifies related exclusions and/ or specific requirements including specialist studies applicable to the proposed site and/or development, based on the national sector classification and the environmental sensitivity of the site.

The EIA Screening tool was applied to the proposed site and the following sensitivities were identified:

Table 3: EIA Sensitivity Themes

THEME	VERY HIGH SENSITIVITY	HIGH SENSITIVITY	MEDIUM SENSITIVITY	LOW SENSITIVITY
Forest Hill				
Agriculture Theme		x		
Animal Species Theme		x		
Aquatic Biodiversity Theme	x			
Archaeological and Cultural Heritage Theme		x		
Civil Aviation Theme		x		
Defence Theme				x
Palaeontology Theme			x	
Plant Species Theme			x	
Terrestrial Biodiversity Theme	x			

Based on the Screening Tool, the following specialist studies is advised by the EAP to be conducted for the Environmental Impact Assessment:

- Agricultural and Land Capability Impact Assessment;
- Terrestrial Biodiversity Impact Assessment (Fauna and Flora);
- Wetland and Aquatic Impact Assessment with c&i Risk Assessment;
- Archaeological and Cultural Heritage Impact Assessment;
- Palaeontology Impact Assessment;
- Geohydrological Impact Assessment;
- Visual Impact Assessment;
- Stormwater Management Plan;
- Blasting, Vibration and Noise Impact Assessment;
- Traffic Impact Assessment;
- Geotechnical Impact assessment;
- Socio-Economic Impact Assessment;
- Air Quality Impact Assessment; and
- Financial Provision and Closure Cost Assessment.

Reasoned Opinion of the EAP

Based on the findings of the preliminary impact assessment (detailed in Section 11) during the Draft Scoping phase, the EAP is of the opinion that the proposed application can continue to the EIA/EMPr Phase as to further investigate the potential impacts and alternatives in detail before a decision is made by the competent authority.

Recommendations

In order to achieve appropriate environmental management standards and ensure that the findings of the environmental studies are implemented through physical measures, the recommendations from the scoping report are included within the Environmental Impact Assessment (EIA) and Environmental Management Programme (EMPr).

Conclusion

A variety of preliminary mitigation measures have been identified that will serve to mitigate the scale, intensity, duration or significance of the potential negative impacts identified for the proposed project. These include guidelines to be applied during the construction, operational and decommissioning, closure and post-closure phases of the proposed Mareesburg project. The Environmental Management Programme (EMPr) in subsequent phases will contain more detailed mitigation measures and will be incorporated into the Environmental Impact Report (EIR).

The proposed alternatives and mitigation measures, if implemented, are expected to reduce the significance of the majority of the already identified potential impacts. It is therefore the recommendation of ENVASS, based on the assessment of the current available information, that the Scoping Report for the proposed development be accepted by the Competent Authority and that the application continue to the EIA/EMPr Phase.

Plan of Study

The Plan of Study describes the nature and extent of the assessment to be conducted and sets out the proposed approach to the EIA phase. In this regard, upon acceptance of the Scoping Report by the DMRE, the EIA phase of the project may commence, and the following key steps will be undertaken:

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ABBREVIATIONS

BAP	Biodiversity Action Plan
CA	Competent Authority
CBA	Broad Critical Biodiversity Area
CCA	Closure Cost Assessment
CSA	Constitution of South Africa (Act No. 108 of 1996)
DEA	Department of Environmental Affairs (now DFFE)
DFFE	Department Forestry, Fisheries and the Environment (formerly known as DEA or DEFF)
DMRE	Department of Mineral Resources and Energy
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECM	Eastern Chrome Mines
EIA	Environmental Impact Assessment
EIR	Environmental Impact Report
EMPr	Environmental Management Programme
ENVASS	Environmental Assurance (Pty) Ltd
FTLM	Fetakgamo Tubatse Local Municipality
GN	Government Notice
GIS	Geographic Information System
GPS	Global Positioning System
HDPE	High-density polyethylene
I&APs	Interested and Affected Parties
IDP	Integrated Development Plan
IEM	Integrated Environmental Management
IWULA	Integrated Water Use License Application
IWWMP	Integrated Water and Waste Management Plan
LDV	Light Duty Vehicle
LIHRA	Limpopo Heritage Resources Authority
LOM	Life of Mine
mamsl	meters above mean sea level
MAR	Mean Annual Run-off
MHSA	Mine Health and Safety Act (Act No. 29 of 1996) [as amended]
MPRDA	Minerals and Petroleum Resources Development Act (Act No. 28 of 2002) (as amended)
NEMA	National Environmental Management Act, 1998 (Act no 107 of 1998) (as amended)
NEMAQA	National Environmental Management: Air Quality Act (Act No. 39 of 2004) (as amended)

NEMBA	National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)
NEMWA	National Environmental Management: Waste Act (Act No. 59 of 2008) (as amended)
NHRA	National Heritage Resource Act, 1999 (Act No. 25 of 1999)
MRA	Mining Right Area
NVFFA	National Veld and Forest Fire Act (Act No. 101 of 1998)
NWA	National Water Act, 1998 (Act No. 36 of 1998)
PM	Public Meeting
PPP	Public Participation Process
ROM	Run of Mine
RSF	Residue Stockpile Facility
RWD	Return Water Dam
SANS	South African National Standards
SAHRA	South African Heritage Resources Agency
SAWS	South African Weather Service
SDF	Spatial Development Framework
SDM	Sekhukhune District Municipality
SM	Site Manager
SoCC	Species of Conservational Concern
tpm	tonne per month

IMPORTANT NOTICE

In terms of the Mineral and Petroleum Resources Development Act (Act 28 of 2002 as amended), the Minister may 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 (as amended), 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, 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.

A. DRAFT SCOPING REPORT

1 INTRODUCTION

This section provides a brief description of the project background, summarises the legislative authorisation requirements, provides the study terms of reference, describes the structure and purpose of the report, and outlines the opportunity for comment.

Please include the following heading under this section:

1.1 PROJECT TITLE

Environmental Authorisation and Mining Right Application for the Proposed Mareesburg Mining Operation, Limpopo Province

1.2 PROJECT BACKGROUND

This application relates to an application for a new Mining Right in terms of the Mineral and Petroleum Resources Development Act, 2002, (Act no. 28 of 2002), for the following:

- Opencast and underground mining of the MG0, MG1, MG2, MG3 and MG4 chromitite seams on the farm Mareesburg 8 JT.
- Extraction and processing of Chrome Ore, PGMs and Associated Minerals (gold, silver, copper, nickel and cobalt) which may be extracted from normal mining of Chromite in the Middle Group (MG) Reefs.

In this application, Platinum Group Metals (PGMs) shall refer to Platinum, Palladium, Rhodium, Ruthenium, Iridium and Osmium.

1.3 SUMMARY OF EXISTING AUHTORISATIONS

None.

1.4 PURPOSE OF THIS REPORT

This Scoping Report has been compiled and distributed for review and comment as part of the Scoping and Environmental Impact Assessment (S&EIA)process that is being undertaken for the project at the Mareesburg Mine. The S&EIA is contemplated in the NEMA EIA Regulations, (GNR 982 of 2014, as amended) in terms of the NEMA.

Further to this and in accordance with the Limpopo Department Department of Mineral Resources and Energy (DMRE) reporting requirements and Appendix 2 to the NEMA EIA Regulations (GNR 982 of 2014, as amended), the key objectives of the scoping process are 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.

Scoping phase is the first phase of the S&EIA process required for the application for environmental authorisation for the proposed Project. The purpose of this Scoping Report is to provide stakeholders with an understanding of the proposed project at Mareesburg, characterise the environmental and social context and describe the associated environmental attributes, identify potential environmental, social and heritage aspects and impacts associated with the Project and invite early input from potentially I&APs and stakeholders in the identification of key issues and areas of concern in order to fully scope them and carry forward those that require more detailed investigation, assessment and mitigation in the next phase, the EIA process.

I&APs are given a 30 day comment period to comment on the Draft Scoping Report before it is finalised and submitted to the DMR for consideration.

Comments are to be submitted to the EAP Consultant whose details are provided in Section 2.1.

1.5 SCOPING REQUIREMENTS AS PER EIA REGULATIONS 2014 (AS AMENDED)

This document has been prepared in accordance with the DMRE Scoping Report template format and was informed by the guidelines posted on the official DMRE website accessed in June 2021. In addition, this report also complies with the requirements of the NEMA and Appendix 2 of EIA Regulations, 2014 (as amended).

Table 4: Structure of The Scoping Report

Legal and Regulatory Requirement		
Relevant section in GNR. 982	**Requirement description**	**Relevant section in this report**
The EAP who prepared the report and the expertise of the EAP	Details of: • the EAP who prepared the report; and • the expertise of the EAP, including a curriculum vitae.	Part A: Section 2
Description of the property	The location of the activity, including: • the 21-digit surveyor general code of each cadastral land parcel; • where available, the physical address and farm name; and • where the requirement information in terms (i) and (ii) is not available, the coordinates of the boundary of the property or properties.	Part A: Section 3
Locality plan.	A plan which locates the proposed activity or activities applied for at an appropriate scale, or, if it is a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or on land where the property has not been defined, the coordinates within which the activity is to be undertaken.	Part A: Figure 1
Description of the scope of the proposed overall activity, including listed and specified activities. Description of the activities to be undertaken.	A description of the scope of the proposed activity: • all listed and specified activities triggered; and • a description of the activities to be undertaken, including associated structures and infrastructure	Part A: Section 5
Policy and legislative context	A description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process	Part A: Section 6
Need and desirability of the proposed activity.	A motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location	Part A: Section 7
Period for which the environmental authorisation is required.	The environmental authorisation is required	Part A: Section 8
Description of the process followed to reach the proposed preferred site.	A full description of the process followed to reach the proposed preferred activity, site and location within the site.	Part A: Section 9.1
Details of the alternatives considered.	Details of all the alternatives considered	Part A: Section 9.2
Details of the public participation process followed.	Details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs	Part A: Section 9.3 and Section 9.4
Summary of issues raised by I&APs.	A summary of the issues raised by I&APs, and an indication of the manner in which the issues were incorporated, or the reasons for not including them.	Part A: Section 9.5

Legal and Regulatory Requirement		
Relevant section in GNR. 982	**Requirement description**	**Relevant section in this report**
Environmental attributes associated with the sites.	The environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects	Part A: Section 10
Impacts identified	The impacts and risks identified for each alternative, • including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts can be reversed; and • that may cause irreplaceable loss of resources; and can be avoided, managed, or mitigated.	Part A: Section 11
Methodology used in determining the significance of environmental impacts	The methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives	Part A: Section 11.1 to Section 11.3
The positive and negative impacts that the proposed activity (in terms of the initial site layout) and alternative will have on the environment and the community that may be affected	Positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects	Part A: Section 11.4
The possible mitigation measures that could be applied and the level of risk	The possible mitigation measures that could be applied and level of residual risk	Part A: Section 11.5
The outcome of the site selection matrix. Final site layout plan	The outcome of the site selection matrix	Part A: Section 11.6
Motivation where no alternative sites were considered.	Alternative locations for the activity where they were investigated, If no alternatives are possible the motivation for not considering such	Part A: Section 11.7
Statement motivating the preferred site.	A concluding statement indicating the preferred alternatives, including preferred location of the activity.	Part A: Section 11.8
Plan of study for the environmental impact assess process	A plan of study for undertaking the environmental impact assessment process to be undertaken	Part B
Description of alternatives to be considered including the option of not going ahead with the activity.	A description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity.	Part B: Section 1.1
A description of the aspects to be assessed as part of the environmental impact assessment process	A description of the aspects to be assessed as part of the environmental impact assessment process.	Part B: Section 1.2
Description of aspects to be assessed by specialists	Aspects to be assessed by specialists	Part B: Section 1.3
Proposed method of assessing the environmental aspects	A description of the proposed method of assessing the environmental aspects, including a description of the proposed method of assessing the environmental aspects including aspects to be assessed by specialists	Part B: Section 1.4

Legal and Regulatory Requirement		
Relevant section in GNR. 982	**Requirement description**	**Relevant section in this report**
including the proposed method of assessing alternatives		
Proposed method of assessing duration significance.	A description of the proposed method of assessing duration and significance.	Part B: Section 1.5
The stages at which the competent authority will be consulted.	An indication of the stages at which the competent authority will be consulted.	Part B: Section 1.6
Particulars of the public participation process with regard to the impact assessment process that will be conducted.	Particulars of the public participation process that will be conducted during the environmental impact assessment process	Part B: Section 1.7
Description of the tasks that will be undertaken during the environmental impact assessment process.	A description of the tasks that will be undertaken as part of the environmental impact assessment process.	Part B: Section 1.8
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	Identification of suitable 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	Part B: Section 2
Other information required by the competent authority	Where applicable, any specific information required by the competent authority.	Part B: Section 3
Other matter required in terms of section 24(4)(a) and (b) of the Act.	Any other matter required in terms of section 24(4)(a) and (b) of the Act.	Part B: Section 4
Undertaking regarding correctness of information	An undertaking under oath or affirmation by the EAP in relation to: • the correctness of the information provided in the report; • the inclusion of comments and inputs from stakeholders and I&APs; and • any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by I&APs.	Part B: Section 5
Undertaking regarding level of agreement	An undertaking under oath or affirmation by the EAP in relation to the level of agreement between the EAP and interested and affected parties on the plan of study for undertaking the environmental impact assessment.	Part B: Section 5

2 DETAILS OF THE EAP WHO PREPARED THE REPORT

2.1 INDEPENDENT ENVIRONMENTAL ASSESSMENT PRACTITIONER CONTACT DETAILS AND QUALIFICATIONS

2014 NEMA EIA Regulations (as amended), Appendix 2. 2. (1) (a) A scoping report must contain the information that is necessary for a proper understanding of the process, informing all preferred alternatives, including location alternatives, the scope of the assessment, and the consultation process to be undertaken through the environmental impact assessment process, and must include— (a) details of—(i) the EAP who prepared the report; and (ii) the expertise of the EAP, including a curriculum vitae;

ENVASS has been appointed as the independent EAP to undertake the S&EIA for the project. The details of the EAP that was involved in the preparation of this Draft Scoping Report is provided in **Table 5** below.

Table 5: Independent EAP Contact Details and Qualifications

EAP	Environmental Assurance (Pty) Ltd
Name of The Practitioner	Louisa Thuynsma
Telephone Number	012 460 9768
Fax Number	012 460 3071
Email Address	louise@envass.co.za
Educational qualifications	University of Stellenbosch, BSc – 2008 University of South Africa, Honours BSc Environmental Management – 2019
Professional Registrations	EAPASA – 2020 (Reg: 272/2019)

(Refer to EAP Qualifications attached as Appendix 1)

ENVASS has no personal interest in the proposed project other than the contractually agreement for consulting services to undertake the S&EIA process. An undertaking by ENVASS declaring its independence, as required by the EIA Regulations, 2014 (as amended) is provided in Appendix 7.

2.2 SUMMARY OF THE EAP'S PAST EXPERIENCE

(Refer to EAP's curriculum vitae as Appendix 2)

Louise obtained a BSc degree from the University of Stellenbosch, an Environmental Mangemenet Honours degree from the University of South Africa (UNISA) and is currently completing a Chemical Environmental Engineering degree at UNISA. She has experience in conducting Environmental Impact Assessments (EIA's), Basic Assessments (BA's), Public Participation Processes (PPP's) and Water, Waste and Air Emission Licence Applications. She has been an environmental and quality management system (EMS & QMS) professional since February 2014. During this time she has provided quality, environmental, and health and safety consulting and auditing services. In addition to providing consulting, training and

assessment experience, Louise has performed ISO 14001 Quality and Environmental Management System audits ations, Water-Use Application Reports and Mining Right Applications.

The EAP has experience in the following disciplines:

- Environmental risk assessments;
- Environmental site screening, investigation and evaluations;
- Environmental legal screenings;
- Environmental feasibility studies;
- Environmental impact assessments;
- Basic assessments;
- Environmental compliance auditing;
- Compilation, implementation and monitoring of environmental management plans;
- Waste Management;
- Waste Disposal site selection screenings;
- Waste license applications;
- Water-Use Licence Applications;
- Mining Right applications; and
- Managing and facilitating public participation.

3 DESCRIPTION OF THE PROPERTY

A description of the properties on which the the proposed Mareesburg underground/opencast mining areas will be located is provied in **Table 6** below:

Table 6: Description of the property

Farm Name:	Portion 0 of the Farm Mareesburg 8 JT (RE Extent) Portion 1 of the Farm Mareesburg 8 JT Portion 2 of the Farm Mareesburg 8 JT Portion 6 of the Farm Mareesburg 8 JT Portion 7 of the Farm Mareesburg 8 JT
Application area (ha)	2129.1158 ha
Magisterial district:	Sekhukhune District Municipality
Distance and direction from nearest town	32 km west of Lydenburg. 34 km south-west of Steelpoort.
21-digit Surveyor General Code for each farm portion	TOJT00000000000800000 TOJT00000000000800001 TOJT00000000000800002 TOJT00000000000800006 TOJT00000000000800007

4 LOCALITY PLAN

Locality Plan of the Proposed Mining Areas in relation to nearest town. (The locality map is also appended in Appendix 3).

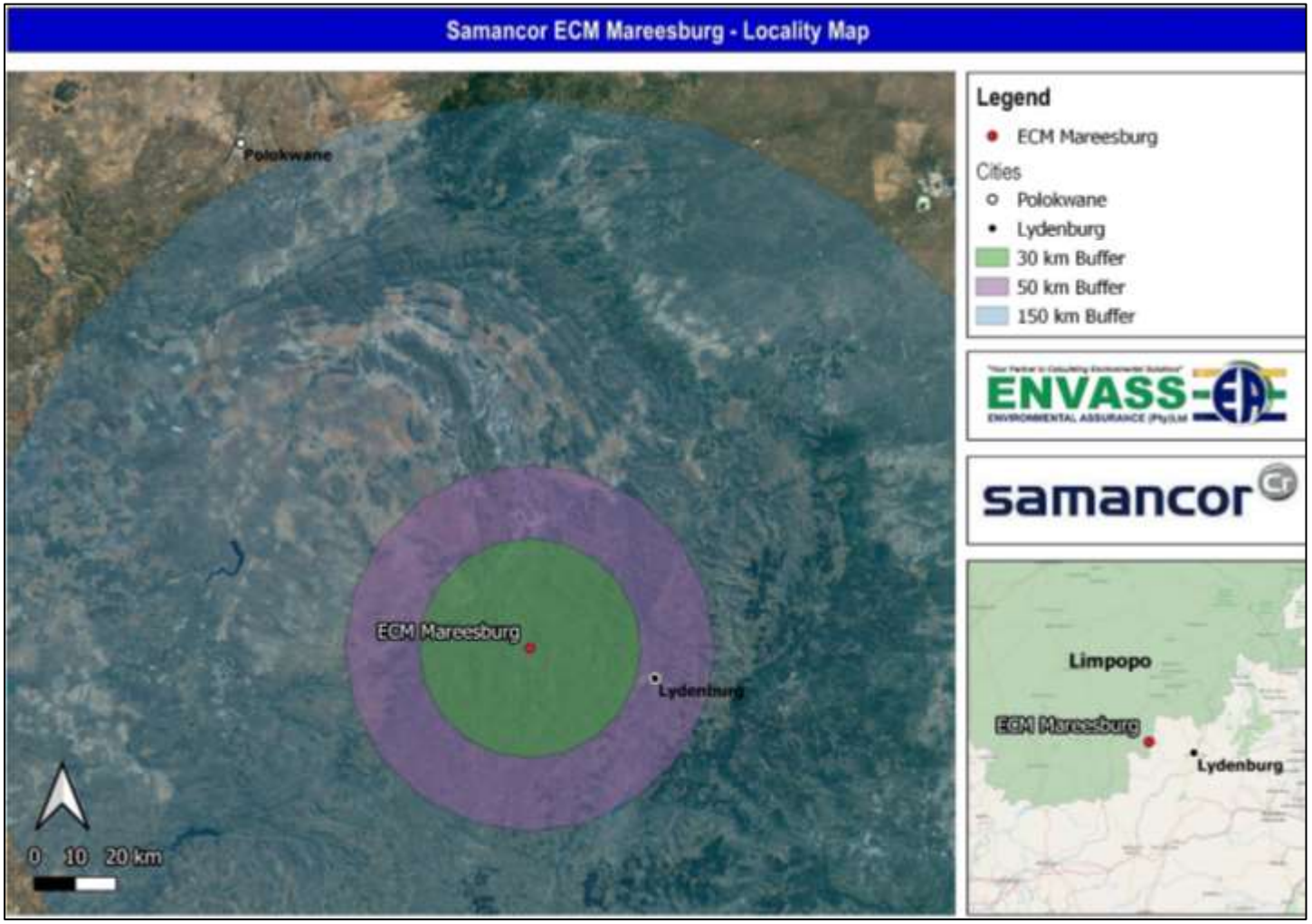


Figure 1: Locality of the Project Site

5 DESCRIPTION OF THE SCOPE OF THE PROPOSED OVERALL ACTIVITY

5.1 LISTED AND SPECIFIED ACTIVITIES

The listed activities in terms of the NEMA EIA Regulations, 2014 (GNR 982, as amended) and NEM:WA applicable to the proposed activity/infrastructure changes are included in Table 7.

Furthermore, a plan drawn to a scale acceptable to the competent authority but not less than 1: 10 000 that shows the location, and area (hectares) of all the aforesaid main and listed activities, and infrastructure to be placed on site is also included as **Figure 2** and **Figure 4** and further attached as **Appendix 4**)

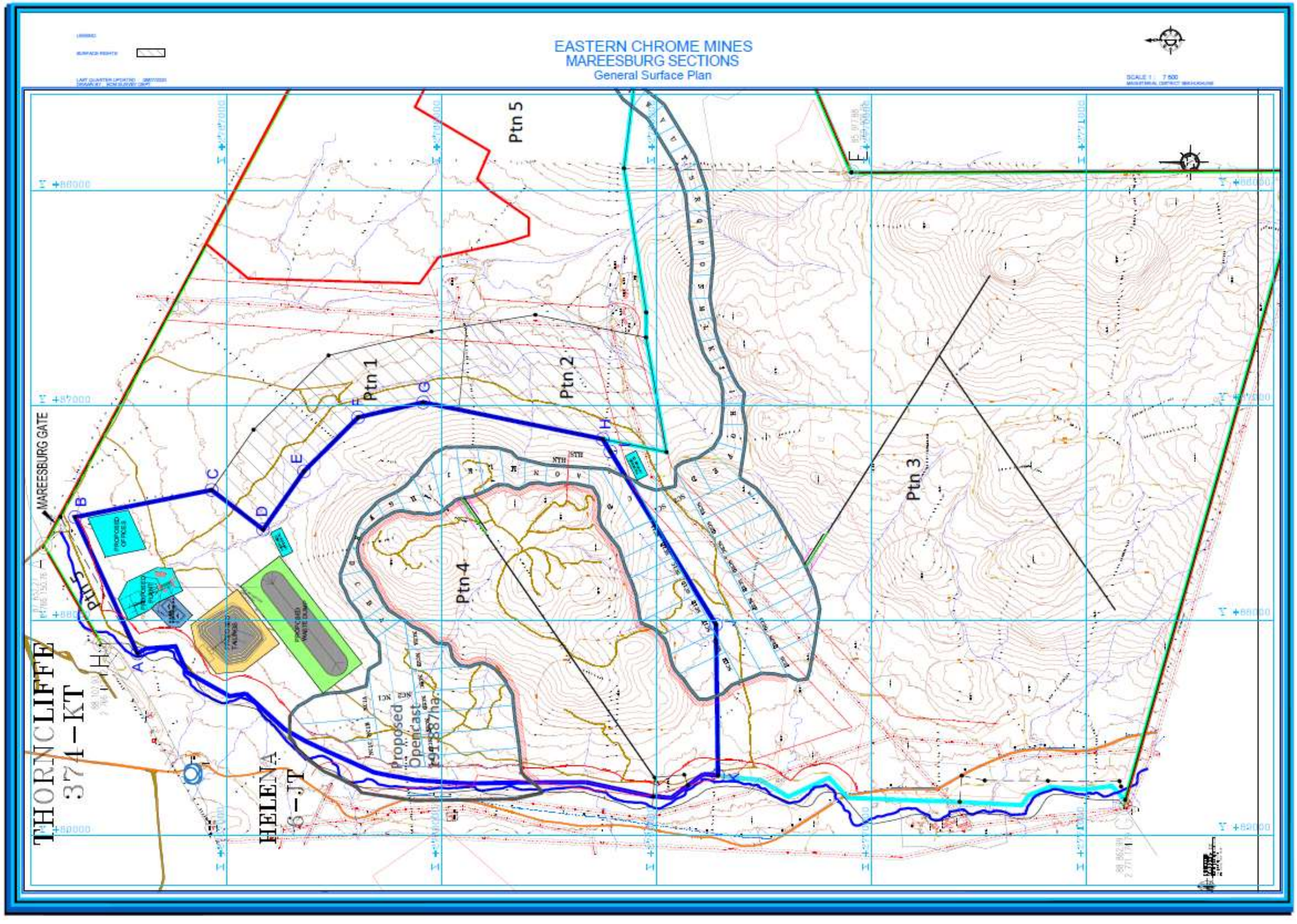


Figure 2: Surface Infrastructure Plan

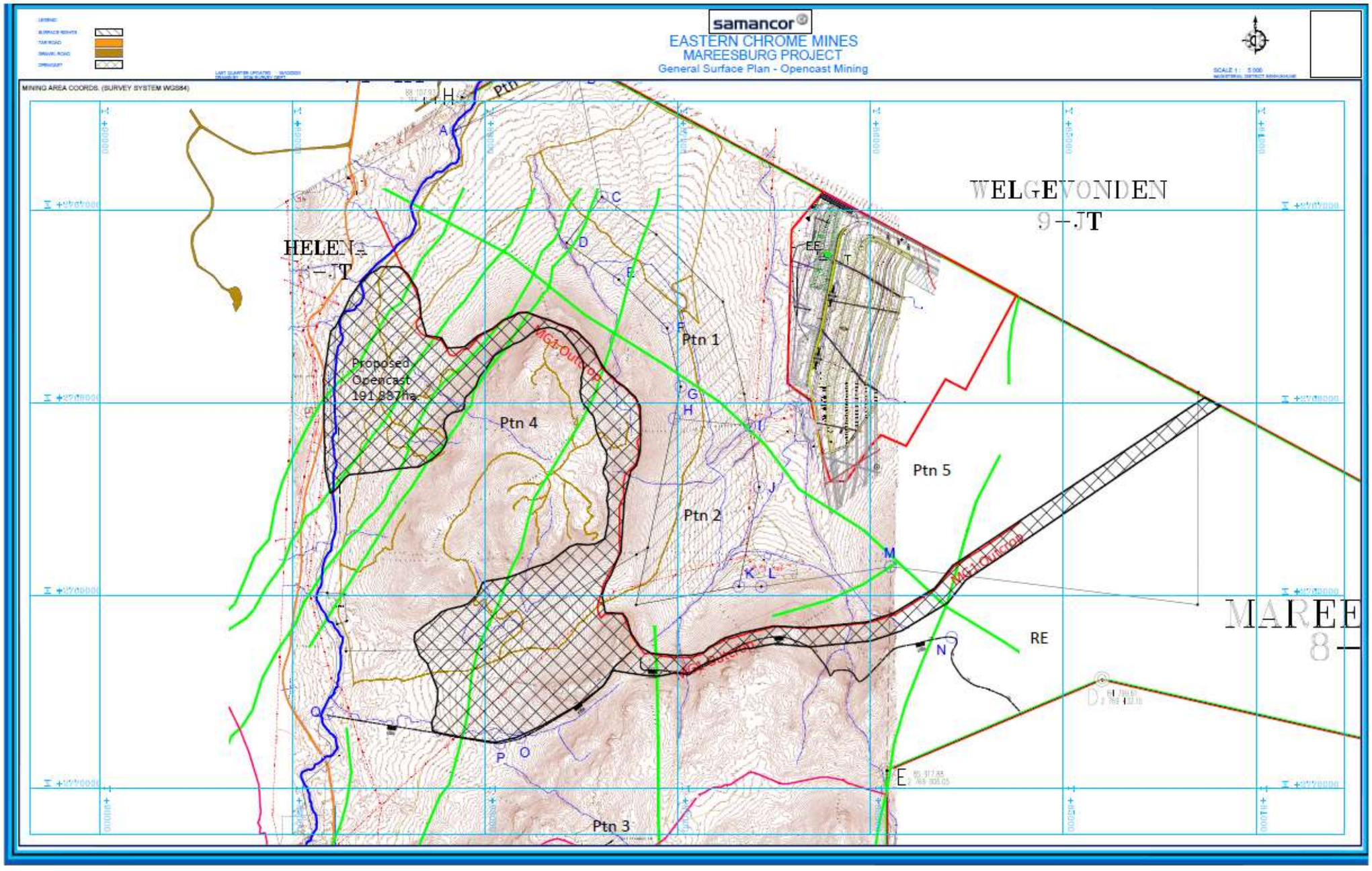


Figure 3: Opencast Mining Areas

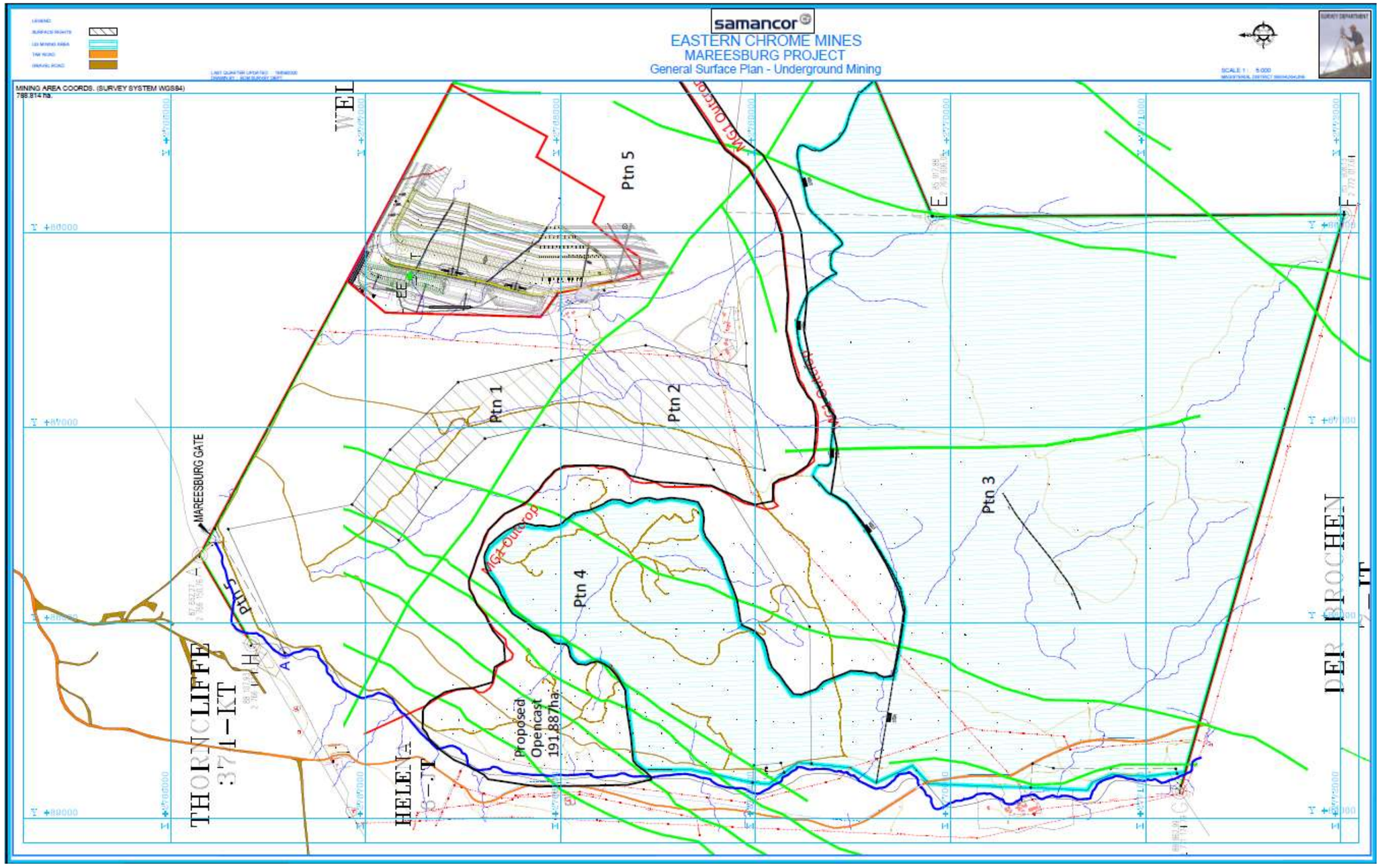


Figure 4: Underground Mining Areas

Table 7: Listed and specified activities

NAME OF ACTIVITY (All activities including activities not listed) **(E.g., 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…etc…etc.)**	**Aerial extent of the Activity** **Ha or m²**	**LISTED ACTIVITY** **Mark with an X where applicable or affected.**	**APPLICABLE LISTING NOTICE** ***(GNR 983 (327), GNR 984 (325) or GNR 985 (324) /NOT LISTED***	**WASTE MANAGEMENT AUTHORISATION** **(Indicate whether an authorisation is required in terms of the Waste Management Act)**
CONSTRUCTION PHASE				
Clearing of vegetation and topsoil and excavation for the access and haul roads, pollution control dam footprint and opencast areas.	TBC	**x**	Listing Notice 1 (GNR 983) Activity 12 Listing Notice 2 (GNR 984) Activity 6 Listing Notice 2 (GNR 984) Activity 15 Listing Notice 3 (GNR 985) Activity 12e Listing Notice 3 (GNR 985) Activity 14e	N/A
Stockpiling of topsoil for rehabilitation purposes.	TBC	**x**	Listing Notice 1 (GNR 983) Activity 12 Listing Notice 2 (GNR 984) Activity 6 Listing Notice 3 (GNR 985) Activity 14e	N/A
Earthworks to excavate in preparation for mining and infrastructure construction.	TBC	**x**	Listing Notice 1 (GNR 983) Activity 12 Listing Notice 2 (GNR 984) Activity 6 Listing Notice 3 (GNR 985) Activity 14e	N/A
Stockpiling of overburden for later rehabilitation.	TBC	**x**	Listing Notice 1 (GNR 983) Activity 12	N/A

NAME OF ACTIVITY (All activities including activities not listed) (E.g., 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…etc…etc.)	**Aerial extent of the Activity Ha or m²**	**LISTED ACTIVITY Mark with an X where applicable or affected.**	**APPLICABLE LISTING NOTICE (*GNR 983 (327), GNR 984 (325) or GNR 985 (324) /NOT LISTED***	**WASTE MANAGEMENT AUTHORISATION (Indicate whether an authorisation is required in terms of the Waste Management Act)**
			Listing Notice 2 (GNR 984) Activity 6 Listing Notice 3 (GNR 985) Activity 14e	
Loading and hauling of topsoil and overburden to stockpiles respectively.	TBC	-	Not Listed.	N/A
Construction of infrastructure required including offices, workshops, ablution facilities, pipelines, power lines, conveyors, processing plant, power lines.	646.927 ha	x	Listing Notice 1 (GNR 983) Activity 10 Listing Notice 2 (GNR 984) Activity 6 Listing Notice 2 (GNR 984) Activity 15 Listing Notice 3 (GNR 985) Activity 12e Listing Notice 3 (GNR 985) Activity 14e	N/A
Construction of Diesel Storage Tanks	TBC	x	Listing Notice 1 (GNR 983) Activity 14 Listing Notice 3 (GNR 985) Activity 10	N/A
Drilling of abstraction and monitoring boreholes.	TBC	x	Listing Notice 2 (GNR 984) Activity 6	N/A
Construction of water management infrastructure (water supply dams, stormwater control berms, PCD's)	TBC	x	Listing Notice 1 (GNR 983) Activity 9 Listing Notice 1 (GNR 983) Activity 10	N/A

NAME OF ACTIVITY (All activities including activities not listed) (E.g., 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…etc…etc.)	**Aerial extent of the Activity Ha or m²**	**LISTED ACTIVITY Mark with an X where applicable or affected.**	**APPLICABLE LISTING NOTICE (*GNR 983 (327), GNR 984 (325) or GNR 985 (324) /NOT LISTED***	**WASTE MANAGEMENT AUTHORISATION (Indicate whether an authorisation is required in terms of the Waste Management Act)**
			Listing Notice 1 (GNR 983) Activity 13 Listing Notice 2 (GNR 984) Activity 6 Listing Notice 1 (GNR 983) Activity 24 Listing Notice 3 (GNR 985) Activity 4e	
Construction of access and haul roads.	TBC	**x**	Listing Notice 2 (GNR 984) Activity 6	N/A
Dust Suppression	Extent of dirt roads open, non-paved areas.	**x**	Listing Notice 2 (GNR 984) Activity 6	N/A
Construction of waste rock dumps and tailings storage facilities	TBC	**x**	Listing Notice 2 (GNR984) Activity 6	GNR 921 Activity 10 GNR 633 Activity 11
OPERATIONAL PHASE				
Clearing of vegetation and topsoil by bulldozer/frontend-loader during opencast mining.	TBC	**x**	Listing Notice 1 (GNR 983) Activity 12 Listing Notice 2 (GNR 984) Activity 6 Listing Notice 2 (GNR 984) Activity 15 Listing Notice 3 (GNR 985) Activity 12e	N/A

NAME OF ACTIVITY (All activities including activities not listed) (E.g., 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…etc…etc.)	**Aerial extent of the Activity Ha or m²**	**LISTED ACTIVITY Mark with an X where applicable or affected.**	**APPLICABLE LISTING NOTICE (*GNR 983 (327), GNR 984 (325) or GNR 985 (324) /NOT LISTED***	**WASTE MANAGEMENT AUTHORISATION (Indicate whether an authorisation is required in terms of the Waste Management Act)**
			Listing Notice 3 (GNR 985) Activity 14e	
Stockpiling of overburden for later rehabilitation.	TBC	**x**	Listing Notice 1 (GNR 983) Activity 12 Listing Notice 2 (GNR 984) Activity 6 Listing Notice 3 (GNR 985) Activity 14e	N/A
Opencast mining using heavy duty earth moving equipment.	TBC	**x**	Listing Notice 1 (GNR 983) Activity 12 Listing Notice 1 (GNR 983) Activity 19 Listing Notice 2 (GNR 984) Activity 6 Listing Notice 2 (GNR 984) Activity 17 Listing Notice 3 (GNR 985) Activity 14e	N/A
Blasting.	TBC	**-**	Not Listed.	N/A
Stockpiling of ROM.	TBC	**x**	Listing Notice 1 (GNR 983) Activity 12 Listing Notice 2 (GNR 984) Activity 6	N/A
Loading, hauling and transport by truck of ROM to stockpiles and processing plant.	TBC	**-**	Not Listed.	N/A

NAME OF ACTIVITY (All activities including activities not listed) (E.g., 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…etc…etc.)	**Aerial extent of the Activity Ha or m²**	**LISTED ACTIVITY Mark with an X where applicable or affected.**	**APPLICABLE LISTING NOTICE (*GNR 983 (327), GNR 984 (325) or GNR 985 (324) /NOT LISTED***	**WASTE MANAGEMENT AUTHORISATION (Indicate whether an authorisation is required in terms of the Waste Management Act)**
Crushing, screening and washing of ROM.	TBC	**x**	Listing Notice 2 (GNR 984) Activity 6	N/A
Deposition of waste rock onto waste rock dump.	TBC	**x**	Listing Notice 2 (GNR 984) Activity 6	GNR 921 Activity 10 GNR 633 Activity 11
Deposition of tailings onto the Tailings Storage Facility.	TBC	**x**	Listing Notice 2 (GNR 984) Activity 6	GNR 921 Activity 10 GNR 633 Activity 11
Maintenance of the PCD and other stormwater infrastructure.	TBC	**x**	Listing Notice 2 (GNR 984) Activity 6	N/A
Dust Suppression	Extent of dirt roads and non-paved areas.	**x**	Listing Notice 2 (GNR 984) Activity 6	N/A
CLOSURE PHASE				
Backfilling and landscaping.	TBC	**x**	Listing Notice 1 (GNR 983) Activity 19 Listing Notice 2 (GNR 984) Activity 6 Listing Notice 2 (GNR 984) Activity 17	N/A
Topsoil placement and reseeding concurrent rehabilitation.	TBC	**x**	Listing Notice 1 (GNR 983) Activity 19 Listing Notice 2 (GNR 984) Activity 6 Listing Notice 2 (GNR 984) Activity 17	N/A

NAME OF ACTIVITY (All activities including activities not listed) (E.g., 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…etc…etc.)	**Aerial extent of the Activity Ha or m²**	**LISTED ACTIVITY Mark with an X where applicable or affected.**	**APPLICABLE LISTING NOTICE (*GNR 983 (327), GNR 984 (325) or GNR 985 (324) /NOT LISTED***	**WASTE MANAGEMENT AUTHORISATION (Indicate whether an authorisation is required in terms of the Waste Management Act)**
Monitoring of rehabilitated areas	TBC	-	Not Listed	N/A

5.2 DESCRIPTION OF THE ACTIVITIES TO BE UNDERTAKEN

(Describe Methodology or technology to be employed, and for a linear activity, a description of the route of the activity)

5.2.1 Background

Environmental Assurance (Pty) Ltd (ENVASS) as independent environmental consultant was appointed by Samancor Chome Limited (Samancor) to undertake the environmental authorisation process for the application of a new Mining Right and associated activities in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) [as amended] (MPRDA), the National Environmental Management Act, 1998 (Act No. 107 of 1998) [as amended] (NEMA), the National Environmental Management: Waste Act, 2008 (Act No 59 of 2008) [as amended] (NEMWA), the National Water Act, 1998 (Act No. 36 of 1998) [as amended] (NWA) and the Environmental Impact Assessment Regulations (2014) as amended. The area is located within the Sekhukhune District Municipality (SDM) and the Fetakgomo Tubatse Local Municipality (FTLM) and is located near the towns of Lydenburg and Steelpoort in the Limpopo Province.

Mareesburg Chrome Mine is located near Thorncliffe Mine, Magareng Mine, Mototolo Mine, Helena Mine and is 15 kilometers south of Tweefontein Mine and accessible via the Steelpoort - Lydenburg roads using the R555 road. To the south, lies Booysendal Platinum Mine.

5.2.2 Mining Activities

The mineral/s that will be mined at Mareesburg 8 JT is the Middle Group (MG) chromite seams and in particular the MG0, MG1, MG2, MG3 and MG4 chromitite seams.

- Opencast and underground mining of the MG0, MG1, MG2, MG3 and MG4 chromitite seams on the farm Mareesburg 8 JT.
- Extraction and processing of Chrome Ore, Platinum Group Metals (PGMs) and Associated Minerals (gold, silver, copper, nickel and cobalt) which may be extracted from normal mining of Chromite in the MG Reefs.

In this application, PGMs shall refer to Platinum, Palladium, Rhodium, Ruthenium, Iridium and Osmium.

5.2.3 Opencast Mining

The current planning indicates that full production will be reached in ten (10) months. The production forecast will depend on market conditions. Due to opencast mining not expected to last more than ten (10) years, the production forecast will be conducted at monthly planning sessions.

The mining method selected will be opencast due to the shallow nature of ore outcropping on surface and so as to make the ore available as early as possible. Mining operations will be conducted by an open pit mining contractor. The primary equipment consists of trucks / excavators & excavator mounted hydraulic rippers to ensure that the chrome ore can be removed with minimum dilution and losses. This mining method is fully mechanised. Drilling will be conducted using drill rigs and cleaning with load haul dump (LHD) trucks. A safe high wall height pending economic viability for the opencast mining method will be applied. Factors that must be taken into account in the mine design strategy included:

- Formal and informal settlements in relation to the planned opencast mining area.
- No blasting will take place within 500m from houses / public buildings or power lines.
- Planned opencast activities within the 500m blasting radius will be done using an excavator mounted hydraulic ripper (No blasting required).
- Waste dumps to be placed away from chrome sub-outcrop positions.
- Backfilling of mined out areas as soon as possible to minimise dust and aid in rehabilitation, minimise haulage costs and double handling.

5.2.4 Underground Mining

The underground mine is planned at 60m - 300m below surface and would yield 960kt/a or 1.2Mt/a. The mining operations are planned to continue for 20 years maximum. The Mine will extract the MG0, MG1, MG2, MG3 and MG4 chromitite layers present subject to favourable market conditions which would make it feasible over the life of mine (LOM). Based on a steady state production rate of 80,000 to 100,000 tons of run of mine (ROM) ore per month, the life of mine is estimated to vary between approximately 15 years and 20 years.

A Bord and Pillar hybrid mining method will be applied. This method requires that the primary and secondary development be developed on-reef by means of trackless mobile machinery and the tertiary development and main reef extraction done by conventional or trackless mining methods. The mining height in the trackless development sections are reef dependent and are not less than 2.2m for all drives except the chairlift decline which has to be developed at a minimum mining height of 3.0m in order to facilitate the future chairlift. Drilling will be done with conventional pneumatic driven rock drills or mechanized drill rigs.

Primary Development

Primary development consists of 2x triple barrel decline cluster systems that is developed on an apparent dip of +/- 10˚. Development is on-reef and executed with low profile trackless mobile mining equipment. The decline cluster consists of a Chairlift decline, a Material decline and a Conveyor decline.

Secondary Development

To unlock the chrome resource on strike, the on-ore secondary development will be done by trackless mining machinery (TMM) equipment. This includes all additional excavation work needed for stoping and cleaning operations in the form of tipping points, muck bays, material bays, dams etc. Strike development consists of 10m wide drives. The drives are developed at an inclination of +1˚ to +2 ˚ (1:100m) above horizontal.

Stoping

On completion of the equipping phase, stoping operation can commence at the stated practical mining rate. The bord and pillar hybrid mining method employs pneumatically driven handheld rock drills or mechanised drills rigs and cleaning by load haul dumpers (LHD's) onto a conveyor belt, which transports the ore out to surface.

The MG0, MG1, MG2, MG3 and MG4 chromitite seams will be mined extensively for approximately 2km along dip and approximately 6km along strike. Mining is planned at depths ranging from 60m to 300m below surface. The underground mine will start with establishment of North and South portals. The decline shafts and strike drives will initially be done to a depth of 300m below surface and to deeper areas in later years. A hybrid mining method was selected for Mareesburg Chrome Mine. This method requires that the primary and secondary development be developed on-reef by means of trackless mobile machinery and the tertiary development and main reef extraction done by conventional mining methods.

5.2.5 PGM Processing Plant Activities

Processing of PGMs will be conducted by Tweefontein Mine or a contractor who will enter into an agreement with Samancor Chrome for retreating of tailings dumps which involves the re-treatment of PGM-rich chrome tailings material to be produced from Mareesburg Chrome Mine. Tweefontein Mine will be provided for in the approved Environmental Management Programme (EMPr) as required and preceded the conversion of the mining rights. After extracting the chrome from the current risings and dumps and returning it to Samancor ECM at nominal cost, a contractor is appointed with the exclusive right to recover PGMs, Associated Minerals and will use flotation cells to produce the PGM concentrate which will be sold to various PGM smelters, including Impala Platinum and Rustenburg Platinum Mines.

The -300mm ROM will be screened at 2mm and 100mm to produce feed for the spiral and dense media separation plants. The screen oversize (+100mm) will be crushed in a closed circuit to produce the required feed sizes. The DMS feed (+2mm-100mm) will produce Lumpy, Small lump and Chips through a DMS plant using ferrosilicon media. The -2mm fines will be fed through a spiral plant and magnetic separator to produce metallurgical concentrate. The waste from the DMS plants will go to the waste dump and the tailings from the spiral plant to the tailings dam (Figure 5).

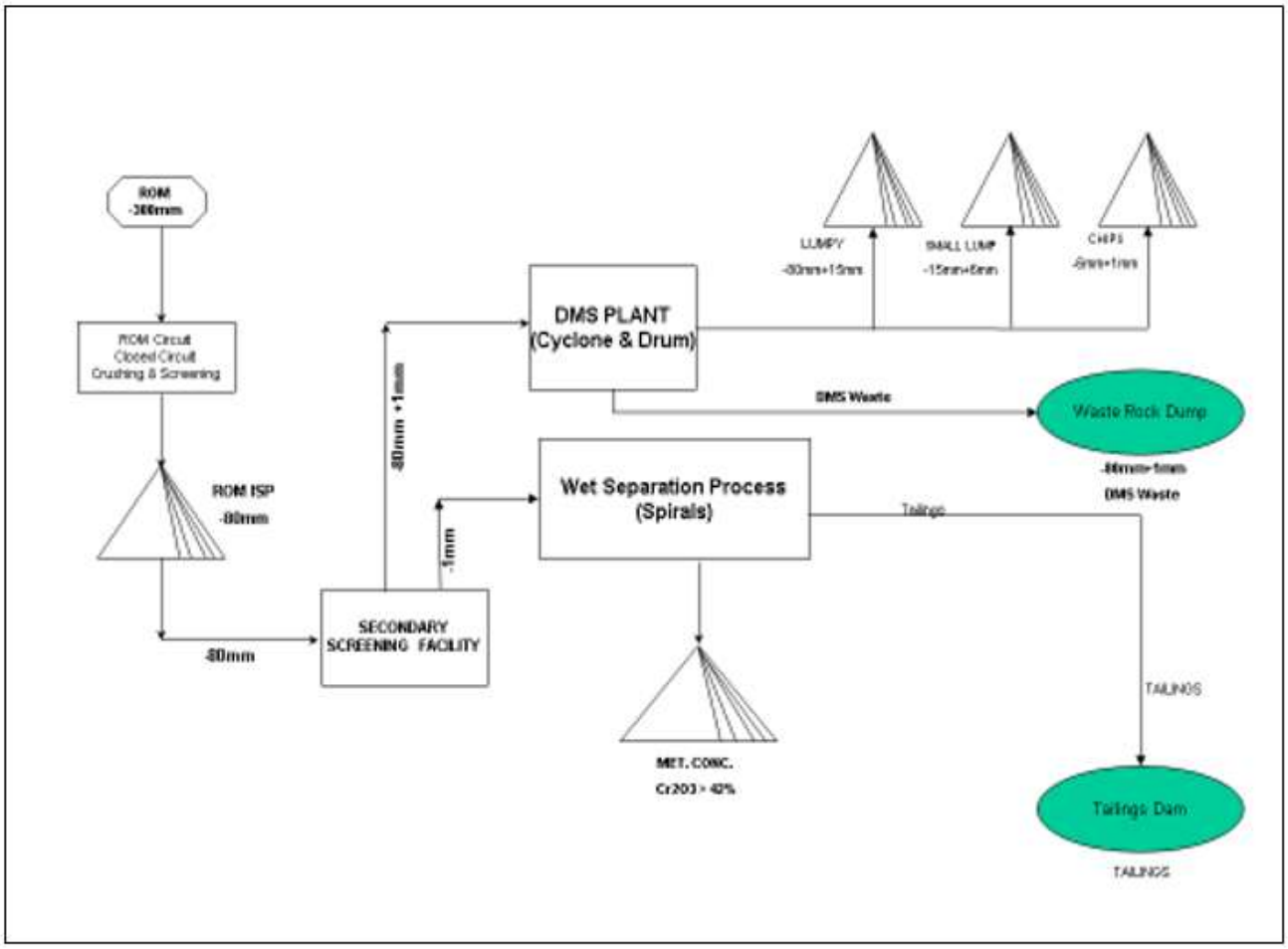


Figure 5: Basic Plant Process Diagram for Mareesburg Chrome Mine

5.2.6 Infrastructure required for the proposed Mareesburg Mine

- Access and internal roads
- Compressors
- Conveyors (underground and surface)
- Weigh Bridge
- Fence
- General surface infrastructure (offices, workshops, lamp room, change rooms, parking areas, stores)
- Wastewater treatment works (sewage plant)
- Crushing and screening plant
- Beneficiation plant
- Residue Stockpile Facilities (Waste Rock Dumps and Tailings Dams)
- Stormwater / return water dams
- Stormwater infrastructure
- Process and potable water
- Electrical substation and power lines

- Salvage yard
- Potable and process water pipelines
- Adits / shafts
- Overburden, soil, and topsoil stockpiles
- Opencast mining areas
- Underground Mining areas and adits
- Product stockpiles

5.2.7 Mining Area to which Application Relates

The estimated life of mine for the proposed opencast mining area is 10 years, and for the underground mining area 24 years. The Mareesburg Section of Eastern Chrome Mines comprises five portions of the Farm Mareesburg 8 JT as shown on the locality plan, **Figure 6**. The mineral being mined at Mareesburg is chromite and in particular the Middle Group (MG) seams. The details regarding each of the farm is shown in the table below. Samancor Limited is not the registered owner of the surface rights. **Table 8** provides a summary of the mining right for the portions and is graphically shown in **Figure 6** below.

Table 8: Summary of Mining Rights for various Portions

Farm Name	No.	Reg. Division	Portion Number	Mineral	Area (ha)	Title Deed	SG Diagram
Mareesburg	8	JT	Portion 0 (RE Extent) Portion 1 Portion 2 Portion 6 Portion 7	Chromite, PGM's & Associated Minerals	2129.1158	T84360/2007PTA	TOJT00000000000800000 TOJT00000000000800001 TOJT00000000000800002 TOJT00000000000800006 TOJT00000000000800007

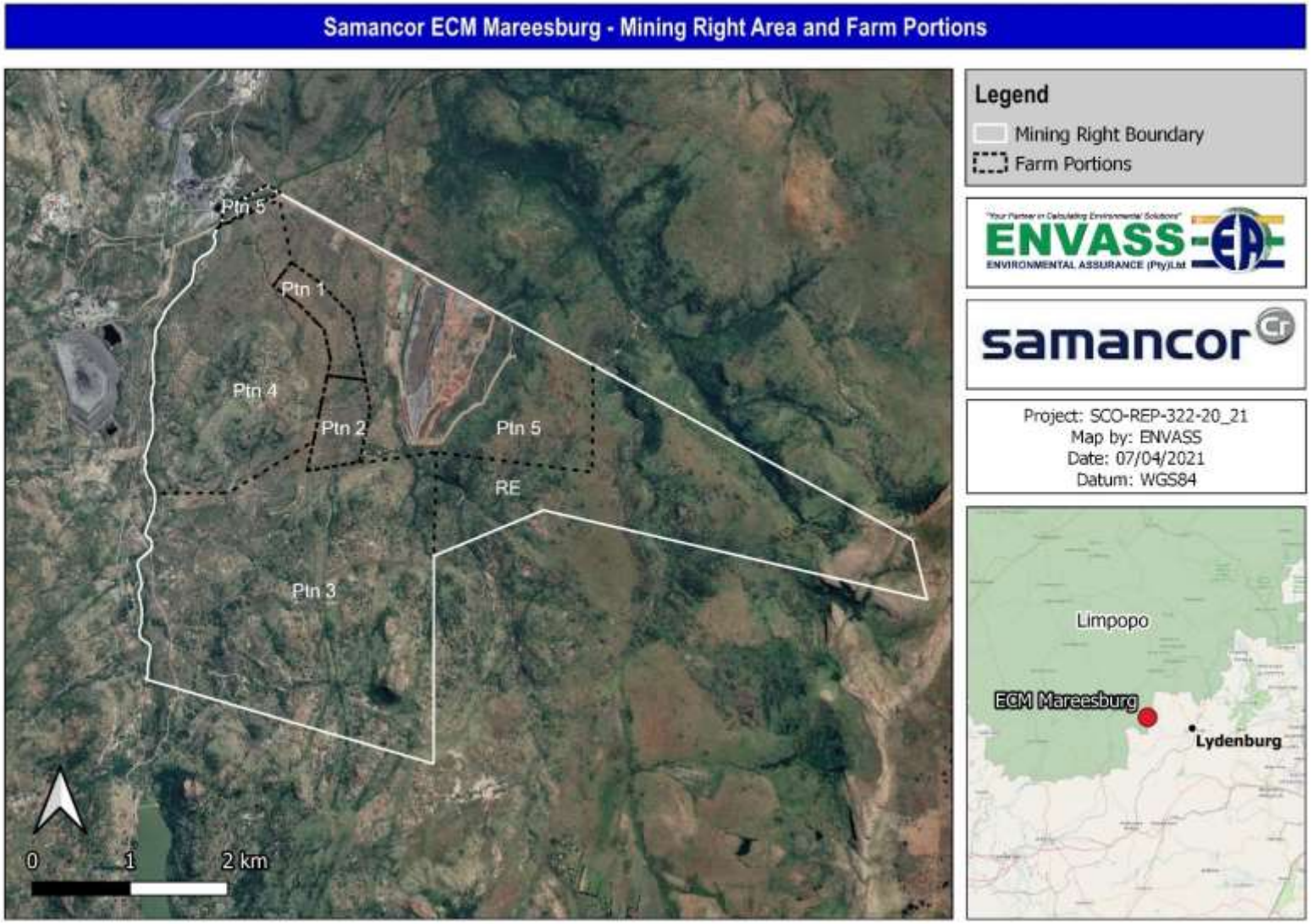


Figure 6: Map of Mining Rights

6 POLICY AND LEGISLATIVE CONTEXT

2014 NEMA EIA Regulations (as amended), Appendix 2- 2(1) a scoping report must include (e) a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process.

Table 9: Policy and Legislative Context

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	COMPETENT AUTHORITY	REFERENCE WHERE APPLIED
Constitution of South Africa, 1996 (Act No. 108 of 1996) [as amended] • *Section 24* *Environment. -Everyone has the right-* *(a) to an environment that is not harmful to their health or well-being; and* *(b) to have the environment protected, for the benefit of present and future generations through reasonable legislative and other measures that-* *i) prevent pollution and ecological degradation;* *ii) promote conservation; and* *Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.*	Constitutional Court of the Republic of South Africa	One of the key legislative measures that has been established is the promulgation of the National Environmental Management Act 107 of 1998 (NEMA). NEMA aims to provide for co-operative environmental governance 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; to provide for certain aspects of the administration and enforcement of other environmental management laws; and to provide for matters connected therewith. NEMA prohibits a person from commencing a listed activity without environmental authorisation. The Project triggers several activities listed in the EIA Regulations Listing Notices 1, 2 and 3 of 2014 (as amended). The procedural requirements for such an application and associated EIA that needs to be undertaken, are prescribed by the EIA Regulations, 2014 (as amended) and informed by guidelines published in terms of Section 24J of NEMA as well as applicable protocols and minimum information requirements. In addition, the proposed development has the potential to harm the environment and poses a risk to the health and wellbeing of people. The Applicant has the overall responsibility to ensure that the rights of people in terms of Section 24 of the Constitution is protected in terms of the proposed development activity.
National Environmental Management Act (No. 107 of 1998) [as amended] • *Section 28 (1)*	DMRE	The Applicant is the developer and overall responsibility of the mine rests with him, in terms of liabilities associated with the

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	COMPETENT AUTHORITY	REFERENCE WHERE APPLIED
Duty of Care and responsibilities to minimise and remediate environmental degradation.		construction, operational, decommissioning, closure and post-closure phase.
EIA Regulations, 2014 (as amended) *The proposed construction, operational and closure activities of the proposed Mareesburg mine triggers listed activities in terms of Listing Notice 1 (GNR 983), Listing Notice 2 (GNR 984) and Listing Notice 3 (GNR 985) for which a Scoping and Environmental Impact Assessment (EIA) process have to be conducted:*	DMRE	The clearance of vegetation for the mining process would require the application for environmental authorisation.
EIA Regulations, 2014 (as amended) *Chapter 6: Regulation 39 to 44: Public Participation;* *Chapter 4: Application for Environmental Authorisation:* *Part 3 Scoping and Environmental Impact Report (S&EIR)* *Appendix 2: Scoping Report* *Appendix 3: Environmental Impact Assessment Report* *Appendix 4: Environmental Management Programme* *Appendix 5: Closure Plan* *Appendix 6: Specialist Reports* *Appendix 7: Environmental Audit Report*	DMRE	The EIA Regulations, 2014 (as amended) prescribes inter alia: The manner in which public participation needs to be conducted as well as the requirements of a scoping and environmental impact assessment process and the content of a scoping report, environmental impact assessment report and environmental management programme. The content of specialist reports, closure plans and environmental audit reports are also provided.
Mineral and Petroleum Resources Development Act, 2002 (Act. 28 of 2002) [as amended]:	DMRE	All mining activities fall under the ambit of the MPRDA. The MPRDA requires that an EMP is prepared to inform the environmental authorisation and mining right decision. The EMP will require a Scoping Report and Environmental Impact Assessment which will need to include a IAPs engagement process, assessment of impacts, assessment of feasible alternatives, development of an environmental management and monitoring plan, provision of maintenance and emergency procedures, environmental awareness plan and financial provision. In addition, there are specific requirements in terms of the MPRDA which Mareesburg Mining will also be submitting to DMR in support of the proposed project.
Mineral and Petroleum Resources Development Regulations (GNR 420).	DMRE	
National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) [as amended] • *Section 16;* *General duty in respect of waste management;* • *Section 17;* *Reduction, re-use, recycling and recovery of waste;* • *Section 18; and* *Extended producer responsibility; and* • *Section 21* *General requirements for storage of hazardous and general waste.*	DFFE	The development activities will produce general and hazardous waste which need to be managed and disposed of according to best practices such as recycling, safe storage, etc.

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	COMPETENT AUTHORITY	REFERENCE WHERE APPLIED
List of Waste Management Activities that have, or are likely to have a detrimental effect on the environment as promulgated in terms of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) [as amended]. *The proposed construction, operational and closure activities of the proposed Mareesburg mine triggers listed activities in terms of GNR 921 and GNR 633 and therefore requires a Scoping and Environmental Impact Assessment (EIA) process to be conducted to obtain a WML.*		The proposed activity will require mine residue disposal facilities at the mine.
Waste Classification and Management Regulations and Norms and Standards for the assessment of for landfill disposal and for disposal of waste to landfill, 2013 (Government Notice 634 – 635 of 2013) promulgated in terms of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) [as amended]; and Regulations regarding the planning and management of residue stockpiles and residue deposits from a prospecting, mining, exploration, or production operation (GN R. 632 of 2015).	DFFE	The development activities will produce general and hazardous waste which need to be managed and disposed of according to best practices such as recycling, safe storage, etc. The proposed activity will require mine residue disposal facilities.
National Water Act, 1998 (Act No. 36 of 1998) [as amended] • *Section 3* *Regulation of flow and control of all water* • *Section 19* *Prevention of pollution to watercourses* • *Section 21* *The water use activities associated with the proposed development requires compliance with the requirements of the NWA as listed under GN No. 19182. An application for an integrated water use license is lodged in terms of Section 21 of the National Water Act, 1998 (Act 36 of 1998) [as amended].*	DWS	Chapter 4 of the National Water Act 36 of 1998 (Section 21 to 55) focuses on water uses. Stormwater must be managed properly to achieve prevention of pollution and hazards and to avoid erosion. In addition, the following water use activities was deemed applicable, therefore requiring a Water Use Licence: • *Section 21 (a) Taking water from a water resource;* • *Section 21 (b) Storing water;* • *Section 21 (c) Impeding or diverting the flow of water in a watercourse;* • *Section 21 (i) Altering the bed, banks, course, or characteristics of a watercourse;* • *Section 21 (g) Disposing of waste in a manner which may detrimentally impact on a water resource; and* • *Section 21 (j) 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.* The appropriate application process for a WUL must be applied for. Regulation 704 also sets

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	COMPETENT AUTHORITY	REFERENCE WHERE APPLIED
		out measures to be adopted by mines to protect and minimise impact of water resources.
Mine Health and Safety Act, 1996 (Act No. 29 of 1996) [as amended] and associated regulations. • *Chapter 2, Sections 2 – 4* *Responsibilities of owner;* • *Chapter 2, Sections 5 – 13* *Responsibilities of manager;* • *Chapter 2, Sections 14 – 18* *Documentation requirements;* • *Chapter 2, Section 19 – 20 and 22 to 24* *Employee's rights and duties; and* • *Chapter 2, Section 21* *Manufacturer's and supplier's duty for health and safety*.	DMRE	The development activities will create an environment that is not safe and healthy for workers on and visitors to the site. The Mines Health and Safety Act (No. 29 of 1996) provides for conditions for safe operation and a healthy working environment through co-operation and consultation on health and safety between the state, employer, employees and their respective representatives
National Heritage Resources Act, 1999 (Act No. 25 of 1999) • *Section 44 (1)* *Preservation and protection of heritage resources* • *Section 3 Types and ranges of heritage resources (i);* *Objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens*. S38?	SAHRA	The Act requires all developers (including mines), to undertake cultural heritage studies for any development exceeding 0.5 ha. It also provides guidelines for impact assessment studies to be undertaken where cultural resources may be destroyed by development activities. Permits must be acquired from the SAHRA before a heritage site (including graves and cemeteries) can be affected or destroyed during development activities. A SAHRA listed consultant should undertake cultural heritage impact assessment. Protection of indigenous heritage resources on the property. Approval will be applied for from Limpopo Heritage Resources Agency (LIHRA) if required.
National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) [as amended] • *Section 32* *Control of dust* • *Section 34* *Control of noise*	Sekhukhune District Municipality	Impacts on surrounding landowners need to be managed through dust and noise mitigation measures.
National Dust Control Regulations, 2013 (Government Notice 827 of 2013) • *Section 3* *Dust fall standard* • *Section 4* *Dust fall monitoring program* • *Section 6* *Measures for control of dust* • *Section 7* *Ambient air quality monitoring (PM10)* • *Section 8* *Offences*	DMRE	Dust emissions need to be monitored in accordance with the standards set out in the monitoring programme with the specified measures due to the Applicant being liable to offences and penalties associated with non-conformance to dust which may influence employees and surrounding landowners.

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	COMPETENT AUTHORITY	REFERENCE WHERE APPLIED
• *Section 9* *Penalties*		
Veld and Forest Fire Act, 1998 (Act No. 101 of 1998) [as amended] • *Section 12 (1)* *Duty of the landowner to prevent fire from spreading to neighbouring properties.*	Department of Agriculture, Forestry and Fisheries	The purposes of this Act are to-- • promote the sustainable management and development of forests for the benefit of all; • create the conditions necessary to restructure forestry in State forests; • provide special measures for the protection of certain forests and trees; • promote the sustainable use of forests for environmental, economic, educational, recreational, cultural, health and spiritual purposes; • promote community forestry; • promote greater participation in all aspects of forestry and the forest products industry by persons disadvantaged by unfair discrimination..
National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) [as amended] • *Section 9* *Norms and standards* • *Section 27* *Delegation of power and duties* • *Section 30* *Financial accountability* • *Section 43* *Biodiversity management plans.*	LEDET	Indigenous vegetation needs to be protected and managed in accordance with management measures set out in the management plans developed for the mine and the Applicant need to ensure he is aware of and covers his liabilities.
Alien and Invasive Species Regulations (Government Notice 598 of 2014) and Alien and Invasive Species List, 2014 in terms of NEMBA (Government Notice 599 of 2014) • *Notice 2* *Exempted Alien Species in terms of Section 66 (1)* • *Notice 3* *National Lists of Invasive Species in terms of Section 70(1) – List 1, 3-9 & 11* • *Notice 4* *Prohibited Alien Species in terms of Section 67 (1) – List 1, 3-7, 9-10 & 12*	LEDET	It is the responsibility of the Applicant to ensure that all prohibited plant and animal species are eradicated as far as possible.
Conservation of Agricultural Resources Act (no. 43 of 1983) • *Section 5* *Prohibition of spreading of weeds* • *Section 12* *Maintenance of soil conservation works and maintenance of certain states of affairs* • *Section 16* *Regional Conservation Committees*	LEDET	Listed invader/alien plants occurring on site which requires management measures to be implemented to strive to maintain the status quo environment, especially through the guidelines provided by the Regional Conservation Committee.

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	COMPETENT AUTHORITY	REFERENCE WHERE APPLIED
Hazardous Substances Act, 1973 (Act 15 of 1973) [as amended] • *Section 2* *Declaration of grouped hazardous substances* • *Section 4* *Licensing* • *Section 16* *Liability of employer or principle* • *Section 9 (1)* *Storage and handling of hazardous chemical substances* • *Section 18* *Offences*	DFFE	The Applicant must ensure the safety of people working with hazardous chemicals (specifically fuels), as well as safe storage, use and disposal of containers during the on-site operational phase together with the associated liability should non-compliance be at the order of the day.
Hazardous Chemical Substances Regulations, 1995 (Government Notice 1179 of 1995) • *Section 4* *Duties of persons who may be exposed to hazardous chemical substances* • *Section 9A (1)* *Penalties*	DFFE	Hazardous substances will be stored and utilised on the site and non-compliance to management measures will result in prosecution of the Applicant in terms of his liabilities to the socio-economic environment.
National Forest Act, 1998 (Act No. 84 of 1998) • *Section 7* *Prohibition of destruction of trees in natural forests* • *Section 62* *Offences relating to protection of forests and trees*	Department of Agriculture, Forestry and Fisheries	The Applicant must prevent cutting, disturbing, damaging or destroying any indigenous, living tree or remove such a living tree from a natural forest without a licence or an exemption.
Limpopo Environmental Management Act, 2003 (Act 7 of 2003). • *Section 18* Declaration of sites of ecological importance • *Section 19* Acquisition of land on which sites of ecological importance are situated • *Section 20* Management of sites of ecological importance • *Section 25* Responsibility for sites of ecological importance, protected environments and private nature reserves on private land • *Section 26* Responsibility for sites of ecological importance, protected environments and private nature reserves on provincial and private land • *Section 28* Mining in protected areas • *Section 31* Hunting of wild and alien animals • *Section 33* Hunting on provincial nature reserves, sites of ecological importance, protected environments and private nature reserves • *Section 35*	LEDET	Specialist assessments will determine the location of sites of ecological importance and whether they are located within the development site. In the event that a site of ecological importance or protected environment is located within the development boundary, the Applicant is required to adhere the requirements of the Limpopo EMA. The Applicant is also required to enforce the requirements related to the hunting, catching, management and picking up of wild and alien animals. Protected plants must be protected, littering prohibited and the Waste-and Noise Regulations implemented and adhered to at all times. Aquatic ecosystems should be protected and not polluted in line with the requirements of the Limpopo EMA. Failure to comply with the Limpopo EMA could result in penalties or prison time.

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	COMPETENT AUTHORITY	REFERENCE WHERE APPLIED
Catching of wild and alien animals • *Section 36* Leaving or making of openings in certain fences • *Section 37* Picking up or removal of wild animals • *Section 57* Protection of aquatic systems • *Section 58* Pollution of aquatic systems • *Section 64* Protection of indigenous plants • *Section 89* Prohibition of littering • *Section 92* Waste Management Regulations • *Section 93* Noise, Vibration and Shock Regulations • *Section 112* Offences		
Limpopo Spatial Planning and land use management bill 2012	LEDET	The Applicant is guided by a system of spatial planning and land use management initiatives set out by the municipality and provincial department in order to promote economic growth.
Northern Province Health Services Act, No. 5 of 1998 Chapter I- Establishment and Organisation of Health Services Chapter II- Transfer of Health Services Facilities to Local Government Chapter III- Health Services Facility Boards Chapter IV. Provincial Health Consultative Forum Chapter V- Admission and Treatment of Patient Chapetr VI- Staff Chapter VII- Health Care Teaching Environments Chapter VIII- Private Health Services Facilities Chapter IX- General	LEDET	The Applicant is required to adhere the requirements of the Northern Province Health Services Act.
Northern Province Land Administration Act (Act 6 of 1999)	LEDET	Confirms the legislative mandate of the provincial government department in matters pertaining to the acquisition and disposal of provincial land and building. The Applicant is required to adhere the requirements of the Northern Province Land Administrative Act.

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	COMPETENT AUTHORITY	REFERENCE WHERE APPLIED
Sekhukhune District Emergency Management Services Bylaws (2011). • *Part III: Fire protection and firefighting* • *Part IV: Dangerous goods* • *Part VI: Storerooms for dangerous goods* • *Part IX: Penalties*	Sekhukhune District Municipality	The SDM implements Emergency Management Services Bylaws to be complied with. These bylaws prescribe measures related to: Fire protection and firefighting: Combustible materials and refuse, making fires, fire breaks, inspection of properties and instructions to occupiers, accessibility of fire-fighting equipment, fire protection requirements for premises, access for fire-fighting and rescue purposes, upkeep and maintenance of fire-fighting equipment, extractor fan systems, rational designs, disposal sites, emergency evacuation plans, water supply for firefighting, registration applications for existing premises; Dangerous goods: Applications for approval of plans, issuing of certificates of registration, supply, exemptions, renewal of permits and certificates, temporary storage requirements, delivery requirements, prohibitions of actions related to, no smoking sign requirements, fire-fighting equipment, reporting of fires, accidents and dumping, sampling, storage tanks and devices that have become obsolete, access to storage tanks for repairs and maintenance, installation, erection, removal and demolition, Group I – III dangerous goods and installation of tanks. Storerooms for dangerous goods: Requirements for storerooms and construction and design of spray-painting rooms. Penalties: Penalties for contraventions
Sekhukhune District Municipality Mine Health and Safety By-laws Could not be retrieved.	Sekhukhune District Municipality	The Applicant is required to comply with the SDM Mine Health and Safety By-laws of which requirements will be included in the EIA phase of the project once the relevant By-law is received from the SDM.
Fetakgamo Tubatse Local Municipality Draft Noise Control By-law Section 3: Prohibition of disturbing noise Section 4: Prohibition of noise nuisance Section 5: Land use Section 6: Designation of controlled areas Section 12: General prohibition Section 14: Exemptions Section 16: Offences and penalties	Fetakgamo Tubatse Local Municipality	The Applicant is required to adhere to the FTLM Noise Control By-Laws in terms of nuisance disturbances and should ensure all activities causing noise has been authorised under the relevant legislation.
Fetakgomo Tubatse Local Municipality Draft Waste Management By-law (2017)	Fetakgamo Tubatse Local Municipality	The Applicant is required to comply with the By-law which is governed by the National Environmental Management: Waste Act 59 of 2008 (as amended)

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	COMPETENT AUTHORITY	REFERENCE WHERE APPLIED
All other relevant national, provincial, district and local municipality legislation and guidelines that may be applicable to the application. Some of these are discussed in the next section but will be discussed in detail within the EIA / EMPR report.		-

7 NEED AND DESIRABILITY OF THE PROPOSED ACTIVITIES

2014 EIA Regulations (as amended), Appendix 2 – 2(1) a scoping report must include (f) a motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location This section contextualises the strategic planning context within which the Project is being proposed. It aims to provide an overview of the need and desirability of the project within a strategic context of national development policy and planning, broader socio-economic needs and regional and local planning, as well as the NEMA principles and sustainable development. More detail pertaining to the need and desirability will be provided in the EIA and EMPr.

According to the Western Cape Department of Environmental Affairs and Development Planning's (WC DEADP) Guideline on Need and Desirability: EIA Guideline and Information Document Series (2011, 2013 and 2017), to describe the need for a development, it must be determined whether it is the right time for locating the type of land use and/or activity being proposed.

To describe the desirability for a development, it must be determined, whether it is the right place for locating the type of land use and/or activity being proposed.

Need and desirability can be equated to the concept of wise use of land which can be determined through the question of what the most sustainable use of land is. Considering the above, the need and desirability of an application must be addressed separately and in detail answering *inter alia* the questions shown in **Table 10**:

Table 10: Need and desirability considerations

A) NEED (TIMING)		
QUESTION A1: Is the land use (associated with the activity being applied for) considered within the timeframe intended by the existing approved SDF agreed to by the relevant environmental authority?		Fetakgomo Tubatse Local Municipality (FTLM) is characterized by large presence of mining activities along the R555 and R37 provincial roads. This sector includes the extracting and beneficiating of minerals such as platinum, lead, chrome, black chrome, and other precious minerals. This sector includes the extracting and beneficiating of minerals occurring naturally, including solids, liquids and crude petroleum and gases. It also includes underground and surface mines, quarries and the operation of oil and gas wells as well as all supplemental activities for dressing and beneficiating of ores and other crude materials. The FTLM Spatial Development Framework 2020 (IDP & Budget 2020/21 for Fetakgamo Tubatse Local Municipality) has identified Mining as the largest sustainable opportunity in the area. According to the IDP, mining activities and natural resources available in the area have created a definite potential to develop tourism and thereby to diversify the economic base of the municipality. The municipality is expecting that retail and service businesses will respond to the opening of mines and the development of housing by also locating close to the mining areas. This may in time alter the current fragmented spatial pattern by creating few large urban settlements, if the expected scale of mining materialises. In addition, the Municipality has identified Burgersfort as a Provincial Growth Point and Steelpoort as a District Growth Point. The Sekhukhune District Municipality District Development Plan 2020 – 2021 indicates the province as replete of the world's largest reserves of the platinum group metals and, in this regard, it holds potential for contribution to the production of clean energy thus enhancing efforts towards sustainable development. Furthermore, the area has large endowments in chrome and vanadium, as well as nickel, iron ore and titanium. During the period between the year 2000 and now there has been almost an explosion of mining development in the area thus providing opportunities for the development of mining inputs manufacturers as well as opportunities for the downstream mining beneficiation. In support of the mining investments, government invested in large infrastructure projects to provide for the foundation on which investments could flourish. Examples of these are raising the wall of the Flag Boshielo Dam as a short-term solution for the provision of water to the mining sector and households in the area. The longer-term solution was the construction of the De Hoop Dam at the cost of no less than R3 billion. Furthermore, plans are being implemented for the improvement of the R37 which is the main artery between Polokwane and Burgersfort. Based on the above, it can be deduced that the land use associated with the activity being applied for have been considered within the timeframe intended by the existing and approved SDF.
YES X	**NO**	

		It should however be noted that a preliminary screening assessment of the environmental assessment in the area identified a high potential for agriculture capability, high animal species sensitivity, high archaeological sensitivity, and the presence of aquatic CBA's and terrestrial CBA's. Specialists in these fields have been appointed to conduct impact assessments and propose preventative or mitigation measures. Specialist findings and recommendations will be included into the EIA / EMPr reports to address the impacts. Alternatively, a permit application will be submitted to the LIHRA.
QUESTION A2: Should development, or if applicable, expansion of the town/area concerned in terms of this land use (associated with the activity being applied for) occur here at this point in time?		The Mareesburg operations life of mine (LOM) for the opencast and underground areas will amount to 10 and 24 years respectively and therefore the benefits for local communities for e.g., employment provision and social upliftment. The Fetakgomo Tubatse Local Municipality Integrated Development Plan highlights the need to develop the mining sector and contribution to the improvement of economies. Additionally, retainment of current employees and the creation of the indirect and induced employment positions would assist in creating an improved standard of living and wellbeing. All the above would assist in responding to needs of local communities but also promote social and economic development. It should however be noted that a preliminary screening assessment of the environmental assessment in the area identified a high potential for agriculture capability, high animal species sensitivity, high archaeological sensitivity, and the presence of aquatic CBA's and terrestrial CBA's. Specialists in these fields have been appointed to conduct impact assessments and propose preventative or mitigation measures. Specialist findings and recommendations will be included into the EIA / EMPr reports.
YES X	**NO**	
QUESTION A3: Does the community/area need the activity and the associated land use concerned (is it a societal priority)?		The proposed Mareesburg Chrome Mine would assist in providing employment opportunities, both indirect and induced within the local and broader economy. As indicated in the Social Labour Plan, the key employee and community benefits that occur because of the operation of the mine are all highlighted. All of which assisted with job creation, business development, education, and youth development. Specifically, as Samancor possess South African in-house mining expertise, it was however decided to conduct all opencast mining operations using contractors. This includes the initial development, and opencast mining. The mine contractor will also be responsible for the maintenance of all haul roads and any other gravel roads within the mine area. Operating costs were developed from first principles on an owner-operated basis using a combination of industry norms and in-house data. ECM is using a scheme whereas community learners are recruited and placed on a skills development program on a quarterly basis. The program enables community learners to undergo institutional and/or workplace training and assessment. The aim of the program is to give the community learners the opportunity to obtain the necessary skills
YES X	**NO**	

		and knowledge as per operational requirement. At the end of the program the community learners will receive a competency certificate which will in return promote job creation and dilute unemployment.
QUESTION A4: Are the necessary services with the adequate capacity currently available (at the time of application), or must additional capacity be created to cater for the development?		Additional capacity needs to be created to cater for the development. Eskom power is available in proximity to the mining site. Electricity will be sourced from diesel generators until electricity can be supplied by Eskom. Water will be sourced from Anglo American De Brochen pipeline. Make up water will be sourced from open pit water and boreholes. A Water Use License Application (WULA) will be submitted to the Department of Water and Sanitation (DWS) for authorisation of water uses required for the proposed mining operations.
YES	**NO X**	
QUESTION A5: Is this development provided for in the infrastructure planning of the municipality, and if not what will the implication be on the infrastructure planning of the municipality (priority and placement of services and opportunity costs)?		In support of the mining investments, government invested in large infrastructure projects to provide for the foundation on which investments could flourish. Examples of these are raising the wall of the Flag Boshielo Dam as a short-term solution for the provision of water to the mining sector and households in the area. The longer-term solution was the construction of the De Hoop Dam at the cost of no less than R3 billion. Furthermore, plans are being implemented for the improvement of the R37 which is the main artery between Polokwane and Burgersfort.
YES X	**NO**	
QUESTION A6: Is this project part of a national programme to address an issue of national concern or importance?		The proposed Mareesburg operations are not part of a national programme to address issues or aspect of national concern, however, as has been eluded to that the project is critical to secure the continuation of the mining operations so as to secure job retention and social infrastructure.
YES	**NO X**	
B) DESIRABILITY (PLACING)		
QUESTION B1: Is the development the best practicable environmental option for this land/site?		A preliminary screening assessment of the environmental assessment in the area identified a high potential for agriculture capability, high animal species sensitivity, high archaeological sensitivity, and the presence of aquatic CBA's and terrestrial CBA's. Specialists in these fields have been appointed to conduct impact assessments and propose preventative or mitigation measures. Specialist findings and recommendations will be included into the EIA / EMPr reports.
YES	**NO X**	
QUESTION B2: Would the approval of this application compromise the integrity of the existing approved and credible municipal IDP and SDF as agreed to by the relevant authorities?		FTLM is characterized by large presence of mining activities along the R555 and R37 provincial roads. This sector includes the extracting and beneficiating of minerals such as platinum, lead, chrome, black chrome, and other precious minerals. This sector includes the extracting and beneficiating of minerals occurring naturally, including solids, liquids and crude petroleum and gases. It also includes underground and surface mines, quarries and the operation of oil and gas wells as well as all supplemental activities for dressing and beneficiating of ores and other crude materials. The Fetakgomo Tubatse Local Municipality Spatial Development Framework 2020 (IDP & Budget 2020/21 for Fetakgamo Tubatse Local Municipality) has identified Mining as the largest sustainable opportunity in the area. According to the IDP, mining activities and natural resources available in the area have created a definite potential to develop tourism and thereby to diversify the economic base of the municipality. The municipality is expecting that retail and service businesses will respond to the opening of mines and the development of housing by also locating
YES X	**NO**	

		close to the mining areas. This may in time alter the current fragmented spatial pattern by creating few large urban settlements, if the expected scale of mining materialises. In addition, the Municipality has identified Burgersfort as a Provincial Growth Point and Steelpoort as a District Growth Point. The Sekhukhune District Municipality District Development Plan 2020 – 2021 indicates the province as replete of the world's largest reserves of the platinum group metals and, in this regard, it holds potential for contribution to the production of clean energy thus enhancing efforts towards sustainable development. Furthermore, the area has large endowments in chrome and vanadium, as well as nickel, iron ore and titanium. During the period between the year 2000 and now there has been almost an explosion of mining development in the area thus providing opportunities for the development of mining inputs manufacturers as well as opportunities for the downstream mining beneficiation. In support of the mining investments, government invested in large infrastructure projects to provide for the foundation on which investments could flourish. Examples of these are raising the wall of the Flag Boshielo Dam as a short-term solution for the provision of water to the mining sector and households in the area. The longer-term solution was the construction of the De Hoop Dam at the cost of no less than R3 billion. Furthermore, plans are being implemented for the improvement of the R37 which is the main artery between Polokwane and Burgersfort. Based on the above, it can be deduced that the approval of this application will not compromise the integrity of the existing approved and credible municipal IDP and SDF as agreed to by the relevant authorities. It should however be noted that a preliminary screening assessment of the environmental assessment in the area identified a high potential for agriculture capability, high animal species sensitivity, high archaeological sensitivity, and the presence of aquatic CBA's and terrestrial CBA's. Specialists in these fields have been appointed to conduct impact assessments and propose preventative or mitigation measures. Specialist findings and recommendations will be included into the EIA / EMPr reports.
QUESTION B3: Would the approval of this application compromise the integrity of the existing environmental management priorities of the area (e.g., as defined in EMFs), and if so, can it be justified in terms of sustainability considerations?		A preliminary screening assessment of the environmental assessment in the area identified a high potential for agriculture capability, high animal species sensitivity, high archaeological sensitivity, and the presence of aquatic CBA's and terrestrial CBA's. Specialists in these fields have been appointed to conduct impact assessments and propose preventative or mitigation measures. Based on the outcome of the specialist impact assessments, the best practical environmental option will be identified. The proposed Mareesburg mining operations have been identified within the Environmental Management Framework for the Olifants and Letaba Rivers Catchment Areas (OLEMF) (December 2009). The Planning and development priorities identified for the Greater Sekhukhune District Municipality has been compiled to actively protect, manage, and enhance the natural environment in order to reduce conflicts between the mining, agriculture and tourism sector in the area. Also to promote mining activities in the area to ensure job creation and development of the Dilokong Corridor. To promote farming, industry and food production (agri-processing), with the help of the proposed De Hoop
YES X	**NO**	

		Dam. Concentrate on promoting tourism of natural beauty and historic culture. Assist in speeding development by focusing on education and skills development. The approval of this application will therefore not compromise the integrity of the existing environmental management priorities of the area.
QUESTION B4: Do location factors favour this land use (associated with the activity applied for) at this place, etc.)?		FTLM is characterized by large presence of mining activities along the R555 and R37 provincial roads. This sector includes the extracting and beneficiating of minerals such as platinum, lead, chrome, black chrome, and other precious minerals. This sector includes the extracting and beneficiating of minerals occurring naturally, including solids, liquids and crude petroleum and gases. It also includes underground and surface mines, quarries and the operation of oil and gas wells as well as all supplemental activities for dressing and beneficiating of ores and other crude materials. The Fetakgomo Tubatse Local Municipality Spatial Development Framework 2020 (IDP & Budget 2020/21 for Fetakgamo Tubatse Local Municipality) has identified Mining as the largest sustainable opportunity in the area. According to the IDP, mining activities and natural resources available in the area have created a definite potential to develop tourism and thereby to diversify the economic base of the municipality. The municipality is expecting that retail and service businesses will respond to the opening of mines and the development of housing by also locating close to the mining areas. This may in time alter the current fragmented spatial pattern by creating few large urban settlements, if the expected scale of mining materialises. In addition, the Municipality has identified Burgersfort as a Provincial Growth Point and Steelpoort as a District Growth Point. The Sekhukhune District Municipality District Development Plan 2020 – 2021 indicates the province as replete of the world's largest reserves of the platinum group metals and, in this regard, it holds potential for contribution to the production of clean energy thus enhancing efforts towards sustainable development. Furthermore, the area has large endowments in chrome and vanadium, as well as nickel, iron ore and titanium. During the period between the year 2000 and now there has been almost an explosion of mining development in the area thus providing opportunities for the development of mining inputs manufacturers as well as opportunities for the downstream mining beneficiation. In support of the mining investments, government invested in large infrastructure projects to provide for the foundation on which investments could flourish. Examples of these are raising the wall of the Flag Boshielo Dam as a short-term solution for the provision of water to the mining sector and households in the area. The longer-term solution was the construction of the De Hoop Dam at the cost of no less than R3 billion. Furthermore, plans are being implemented for the improvement of the R37 which is the main artery between Polokwane and Burgersfort. Based on the above, it can be deduced that location factors favour this land use at this place.
YES X	**NO**	

<table>
<tr><td colspan="2"></td><td>It is however noted that the other land uses in the area are mostly associate with grazing, which is a land use option that could be replaced through rehabilitation post mining. Consideration is however given to the agricultural, heritage, biodiversity and aquatic sensitivities of the Mareesburg Farm</td></tr>
<tr><td colspan="2">QUESTION B5: Will the activity or the land use associated with the activity applied for, impact on sensitive natural and cultural areas (built and rural/natural environment)?</td><td rowspan="2">A preliminary screening assessment of the environmental assessment in the area identified a high potential for agriculture capability, high animal species sensitivity, high archaeological sensitivity, and the presence of aquatic CBA's and terrestrial CBA's. Specialists in these fields have been appointed to conduct impact assessments and propose preventative or mitigation measures. Specialist findings and recommendations will be included into the EIA / EMPr reports.</td></tr>
<tr><td>YES X</td><td>NO</td></tr>
<tr><td colspan="2">QUESTION B6: Will the development impact on people's health and wellbeing (e.g., in terms of noise, odours, visual character and sense of place, etc.)?</td><td rowspan="2">Noise, dust, and visual pollution is expected to increase slightly. The possibility of changes to the water quality regime is also considered, however the actual impact is expected to be low in the mining areas.

If, however the sources of windblown dust and noise is managed effectively, a net cumulative medium to low impact is most likely. The public participation process is also used to ensure that people in the affected environment is consulted on these aspects, this is done in parallel to base line noise and dust fall out data sets against which futuristic changes can be compared.

These impacts will be assessed in detail during the EIA phase of the application, where detailed prevention and mitigation measures will be recommended based on specialist recommendations.</td></tr>
<tr><td>YES X</td><td>NO</td></tr>
<tr><td colspan="2">QUESTION B7: Will the proposed land use result in unacceptable cumulative impacts?</td><td rowspan="2">The cumulative impact of the proposed Mareesburg Chrome Mine is at the point of scoping defined as sum of the nett effect of all impacts, at various levels and intensities, including but not limited to the impacts associated with increased noise, dust change of visual profiles, changes to sense of place, changes to land use and land capability, impact on aquatic biodiversity, impacts on terrestrial biodiversity, heritage resources, impacts on ground and surface water as well as possible impacts associated with the loss of biodiversity.

It is however envisioned that through the implementation of good practice environmental management measures as well as mitigation measures, should the cumulative impact of the proposed Mareesburg Chrome Mine be reduced or prevented based on specialist recommendations. It is however expected that some impacts, those associated with sensitive and or critical aspects, will present less opportunity to be mitigated and will be subjected to longer term impact management programmes such as land rehabilitation or prevention like offset programmes. In addition, should preferred alternatives, specialist and EMPr mitigation measures be considered and effectively implemented, the development is the best practicable environmental option for this land due to the location of the ore bodies.</td></tr>
<tr><td>YES</td><td>NO X</td></tr>
</table>

7.1 SOCIO-ECONOMIC CONTRIBUTION OF SAMANCOR CHROME ECM MAREESBURG

Samancor Chrome (Pty) Ltd, ECM contributes towards socio-economic growth of the local community and surrounds. The mission statement of the Samancor Foundation is to "improve the quality of life of our communities", which is to be achieved through allocating appropriate funds to any projects that can "make a difference". The positive impacts of the development relate to employment creation, skills development, economic development, upgrading of infrastructure and, most significantly, to Social Investment into the affected communities.

7.1.1 Employment Creation

Local labour is given preference for employment opportunities. In addition, it was decided to conduct all opencast mining operations using contractors. This includes the initial development, and opencast mining. The mine contractor will also be responsible for the maintenance of all haul roads and any other gravel roads within the mine area. Operating costs were developed from first principles on an owner-operated basis using a combination of industry norms and in-house data. **Table 11** to **Table 14** indicates the proposed employment creation for the Mareesburg Chrome Mine.

Table 11: Labour Forecast

SAMANCOR CHROME, EASTERN CHROME MINES							
MAREESBURG CHROME MINE							
LABOUR FORECAST							
Employment Level		Current Workforce	Forecast				
			FY1	FY2	FY3	FY4	FY5
E	Senior Management	0	1	1	1	1	1
D	Middle Management	0	1	1	1	1	1
C	Junior Management	0	3	3	3	3	3
B	Semi- skilled and discretionary decision making	0	7	7	7	7	7
A	Defined Decision Making	0	0	0	0	0	0
	Total	**0**	**12**	**12**	**12**	**12**	**12**
	Total Non-permanent employees	**0**	0	0	0	0	0
	GRAND TOTAL	**0**	**12**	**12**	**12**	**12**	**12**

Table 12: Shared Services Labour Forecast

SAMANCOR CHROME, EASTERN CHROME MINES							
MAREESBURG CHROME MINE							
LABOUR FORECAST							
Employment Level		**Current Workforce**	**Forecast**				
			FY1	**FY2**	**FY3**	**FY4**	**FY5**
E	Senior Management	0	13	13	13	13	13
D	Middle Management	0	31	31	31	31	31
C	Junior Management	0	108	108	108	108	108
B	Semi- skilled and discretionary decision making	0	169	169	169	169	169
A	Defined Decision Making	0	12	12	12	12	12
	Total	**0**	**333**	**333**	**333**	**333**	**333**
	Total Non-permanent employees	**0**	**0**	**0**	**0**	**0**	**0**
	GRAND TOTAL	**0**	**333**	**333**	**333**	**333**	**333**

Table 13: Subcontractors Employees

CATEGORY	**YEAR 1**	**YEAR 2**	**YEAR 3**	**YEAR 4**	**YEAR 5**	**YEAR 6**	**YEAR 7**	**YEAR 8**	**YEAR 9**	**YEAR 10**
Top management	1	1	1	1	1	1	1	1	1	1
Senior Management	2	2	2	2	2	2	2	2	2	2
Professionally qualified and experienced specialists and mid management	10	10	10	10	15	15	15	15	15	15
Skilled technical and academically qualified workers, junior management, supervisors, foreman and superintendents	50	50	50	50	60	60	70	70	70	70
Semi-skilled and discretionary decision making	15	15	15	15	20	20	25	25	25	25
TOTAL CONTRACT	**BUDGET**	**BUDGET**	**BUDGET**	**BUDGET**	**BUDGET**	**BUDGET**	**BUDGET**	**BUDGET**	**BUDGET**	**BUDGET**
BUDGET (Not only salaries &wages)	78	78	78	78	98	98	113	113	113	113

Table 14: Service Providers

LIST OF SPECIALISTS, CONSULTANTS AND SERVICE PROVIDERS	BUDGET YEAR 1	BUDGET YEAR 2	BUDGET YEAR 3	BUDGET YEAR 4	BUDGET YEAR 5	BUDGET YEAR 6	BUDGET YEAR 7	BUDGET YEAR 8	BUDGET YEAR 9	BUDGET YEAR 10
Interdump	35	35	35	35	35	35	35	35	35	35
TOTAL BUDGET (SERVICES)										

7.1.2 Skills Development

Skills development can be regarded as one of the most significant beneficial impact the mine can have on local communities.

ECM is using a scheme whereas community learners are recruited and placed on a skills development program on a quarterly basis. The program enables community learners to undergo institutional and/or workplace training and assessment. The aim of the program is to give the community learners the opportunity to obtain the necessary skills and knowledge as per operational requirement. At the end of the program the community learners will receive a competency certificate which will in return promote job creation and dilute unemployment.

7.1.3 Economic Development

Economic development resulting from the proposed Mareesburg Chrome Mine, can benefit local communities, relating to direct employment opportunities and spin-off industries. The scope of potential spin-off industries which may arise/benefit from the development will depend largely on the local communities' sense of entrepreneurship to identify and exploit possible opportunities.

7.1.4 Upgrading of Infrastructure

An area in which the mine may contribute to the upgrading of infrastructure, is in relation to the upgrading of roads, notably the R37 which is the main tar road passing all the affected communities. This road is currently used by numerous mines located along it, and should investment in upgrading it be undertaken, it would be done as a joint venture between these different mines.

7.1.5 Social Investment

Mareesburg will invest and implement the following sustainable community development initiatives to, as intended in the SLP:

- Social Labour Plans

- Black Economic Empowerment (BEE)
- Skills Development Plan
- Employ previously disadvantaged individuals
- An Internship and Bursary Plan
- Adult Education and Training
- Local Economic Development Projects

8 PERIOD FOR WHICH THE ENVIRONMENTAL AUTHORISATION IS REQUIRED

The listed activities being applied for are detailed in **Section 5**. The facilities that will be developed will exist/be operated for the life of mine as support to the mine's day to day operations. The Integrated Environmental Authorisation is therefore required for the Life of mine. The authorisation for the activities is required for a period of 24 years.

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

The determination of the specific site layout having taken into consideration (1) the comparison of the originally proposed site plan, the comparison of that plan with the plan of environmental features and current land uses, the issues raised by interested and affected parties, and the consideration of alternatives to the initially proposed site layout as a result

9.1 DETAILS OF ALL ALTERNATIVES CONSIDERED

With reference to the site plan provided as Appendix 4 and the location of the individual activities on site, details of the alternatives considered with respect to the following have been considered:

(a) the property on which or location where it is proposed to undertake the activity;
(b) the type of activity to be undertaken;
(c) the design or layout of the activity;
(d) the technology to be used in the activity;
(e) the operational aspects of the activity; and
(f) the option of not implementing the activity.

According to the Western Cape Department of Environmental Affairs & Development Planning (WC DEADP) Guideline on alternatives: EIA Guideline and Information Document Series (2011) feasible and reasonable alternatives have to be identified for a development as required by the NEMA EIA Regulations, 2014 (as amended) and applicable to EIA. Each alternative is to be accompanied by a description and comparative assessment of the advantages and disadvantages that such development and activities will pose on the environment and socio-economy. Alternatives form a vital part of the initial assessment process through the consideration of modifications to prevent and/or mitigate environmental impacts associated

with a particular development. Alternatives are to be amended when the development's scope of work is amended. It is vital that original as well as amended alternative identification, investigation, and assessment together with the generation and consideration of modifications and changes to the development and activities are documented.

Although an array of alternatives could be investigated for each project, such alternatives will not necessarily be applicable to each project and/or project phase. However, it must always be strived to seek for alternatives that maximises efficient and sustainable resource utilisation and minimise any negative impacts on the bio-physical and socio-economic environments.

9.2 FEASIBLE ALTERNATIVES

The following three (3) alternatives were investigated during the scoping phase as possible feasible alternatives:

- Mining the whole Mining Right Area with a Biodiversity Offset (preferred alternative);
- Exclusion of High Sensitivity areas as identified during specialist assessments;
- Not implementing the activities *(No – Go alternative)*.

Table 15 below contains the analysis of alternatives identified.

Table 15: Alternatives Analysis

TYPE OF ALTERNATIVE: **Location**	**ALTERNATIVE EXPLANATION:** **Develop on an alternative property** **Develop on alternative sites on the same property/properties**
Mining the whole Mining Right Area (preferred alternative) Mining the whole of the Mining Right area will yield optimal ore body, therefore, extending life of mine to a maximum and increasing job opportunities and the contribution to the local economic development. This alternative has a possibility of impacting on the receiving environment, specifically aspects related to: • Terrestrial Biodiversity; • Aquatic Biodiversity; • Archaeological and Heritage artifacts; and • Land Capability. Exclusion of areas assessed by specialists to have a high environmental sensitivity The preferred alternative will be reassessed during the EIA phase by taking into consideration the findings and recommendations of the relevant specialist studies, which may impact on the location and layout of the proposed mining operations.	
TYPE OF ALTERNATIVE: **Activity**	**ALTERNATIVE EXPLANATION:** **Develop an alternative activity**
The application is for the application of a Mining Right. No activity alternatives have been identified or are assessed as part of this application.	
TYPE OF ALTERNATIVE: **Design**	**ALTERNATIVE EXPLANATION:** **Adapt architectural and/or engineering designs.**

The Design alternatives are limited by the availability of the reserves and environmental and infrastructure barriers. The engineering designs and alternatives will be investigated during the EIA phase with consideration of specialist inputs.

TYPE OF ALTERNATIVE:	ALTERNATIVE EXPLANATION:
Layout	**Adapt spatial configurations of an activity on any particular site**

As with the design alternatives the layout alternatives are limited by the availability of the reserves and environmental and infrastructure barriers. The following preliminary alternative assessment has been completed:

Mining the whole Mining Right Area (preferred alternative)

Mining the whole of the Mining Right area will yield optimal ore body, therefore, extending life of mine to a maximum and increasing job opportunities and the contribution to the local economic development. This alternative has a possibility of impacting on the receiving environment, specifically aspects related to:

- Terrestrial Biodiversity;
- Aquatic Biodiversity;
- Archaeological and Heritage artifacts; and
- Land Capability.

Exclusion of areas assessed by specialists to have a high environmental sensitivity

The preferred alternative will be reassessed during the EIA phase by taking into consideration the findings and recommendations of the relevant specialist studies, which may impact on the location and layout of the proposed mining operations.

TYPE OF ALTERNATIVE:	ALTERNATIVE EXPLANATION:
Technological	**Adapt methods or processes that can be implemented to achieve the same goal**

No alternatives to adjust technological methods or process are assessed in this application as the mined, crushed and screened material will be transferred to other authorised plants for processing.

TYPE OF ALTERNATIVE:	ALTERNATIVE EXPLANATION:
Demand	**The demand for products and/or services can be met by other means.**

No alternatives to meet demand were identified or are assessed in this application.

TYPE OF ALTERNATIVE:	ALTERNATIVE EXPLANATION:
Input	**Implement different input materials and/or sources**

No input alternatives were identified or are assessed in this application.

TYPE OF ALTERNATIVE:	ALTERNATIVE EXPLANATION:
Routing	**Implement alternative routes for linear developments such as power line servitudes, transportation and pipeline routes.**

Routing options will be taken into account once specialist findings and recommendations can be taken into consideration.

TYPE OF ALTERNATIVE:	ALTERNATIVE EXPLANATION:
Transport	**Method of transportation of product or ore.**

Road (preferred alternative)

All final products will be trucked from site as infrastructure is well established and there is little need for infrastructure upgrades for access and haul roads.

Railway

There is no railway line situated on the proposed mining area and therefore the required railway infrastructure will need to be constructure. This is therefore not regarded as the preferred alternative.	
TYPE OF ALTERNATIVE: **Scheduling and Timing**	**ALTERNATIVE EXPLANATION:** **Adapt the order and/or scheduling of a number of measures which plays a part in a program as it will influence the overall effectiveness of the end result.**
At this stage, no alternatives in terms of scheduling and timing have been identified or are assessed.	
TYPE OF ALTERNATIVE: **Scale**	**ALTERNATIVE EXPLANATION:** **Adapt the scale of an activity ex. 15 vs. 35 housing units, 12m2 vs. 0.5km2.** **P.S. Scale and magnitude is interrelated.**
Scale options will be taken into account once specialist findings and recommendations can be taken into consideration.	
TYPE OF ALTERNATIVE: **Magnitude**	**ALTERNATIVE EXPLANATION:** **Adapt the magnitude which is directly related to the extent of an activity.**
At this stage, no alternatives in terms of magnitude have been identified or are assessed.	
TYPE OF ALTERNATIVE: **No-Go**	**ALTERNATIVE EXPLANATION:** **The option of not undertaking and implementing the activity at all.**
Local, regional, and national socio-economic environment will not benefit from the mining activities, should the proposed Mareesburg Chrome Mine not be approved, and the identified direct and cumulative negative environmental impacts would not take place.	

Should the development be approved, the preferred alternative would yield a maximum positive socio-economic impact on the local and regional economy. The possibility of impacting on the receiving environment, specifically aspects related to the listed aspects below should however be assessed further during the EIA phase of this project by taking into consideration the findings and recommendations of specialist impact assessments:

- Terrestrial Biodiversity;
- Aquatic Biodiversity;
- Archaeological and Heritage artifacts; and
- Land Capability.

Specialist and EMPr mitigation measures should in any event be considered and effectively implemented. This will ensure the best practicable environmental outcome in the event of approval and / or development.

9.3 DETAILS OF THE PUBLIC PARTICIPATION PROCESS FOLLOWED DURING INITIAL PRE-APPLICATION PROJECT ANNOUNCEMENT

Guideline 7 on "Public Participation in the Environmental Impact Assessment Process" published by Department of Environmental Affairs (DEA) in October 2012, states that public participation is one of the most important aspects of the environmental authorisation process. This stems from the requirement that people have a right to be informed about potential decisions that may affect them and that they must be afforded an opportunity to influence those decisions. Effective public participation also facilitates informed decision-making by the Competent Authority and may result in better decisions as the views of all parties are considered.

The benefits of public participation include the following:

- Provides an opportunity for interested and affected parties (I&APs), environmental assessment practitioners (EAPs) and the competent authority (CA) to obtain clear, accurate and understandable information about the environmental impacts of the proposed activity or implications of a decision;
- Provides I&APs with an opportunity to voice their support, concerns and questions regarding the project, application or decision;
- Provides I&APs with the opportunity to suggest ways of reducing or mitigating negative impacts of an activity and for enhancing positive impacts;
- Enables the applicant to incorporate the needs, preferences and values of affected parties into the application;
- Provides opportunities for clearing up misunderstandings about technical issues, resolving disputes and reconciling conflicting interests;
- It is an important aspect of securing transparency and accountability in decision-making; and
- Contributes toward maintaining a healthy, vibrant democracy.

A Public Participation Process (PPP) is a requirement in terms of Regulations 39 – 44 of the Environmental Impact Assessment Regulations (2017) of the National Environmental Management Act (Act No. 107 of 1998) [as amended] and the National Water Act (Act No. 36 of 1998) [as amended] and forms an integral part of any EIA process.

This section describes the public participation process undertaken in line with Section 6 of the NEMA EIA Regulations (GNR 982 of 2014, as amended). A joint Public Participation Process will be undertaken for the Environmental Authorisation, Waste Management Licence and Water use license activities. The process is undertaken to ensure compliance with the requirements in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) [as amended] (MPRDA), the National Environmental Management Act, 1998 (Act No. 107 of 1998) [as amended] (NEMA), the National Water Act, 1998 (Act No. 36 of 1998) [as amended] (NWA), the National Environmental Management Waste Act, 2008 (Act 59 of 2008) [as amended] (NEMWA) and the Environmental Impact Assessment Regulations (2014),as amended 2017.

9.3.1 Identification of Key Interested and Affected Parties (Affected and Adjacent landowners) and Other Stakeholders (Organs of State and Other Parties)

Public Participation is the involvement of all parties who are either potentially interested and or affected by the proposed development. The principle objective of public participation is to inform and enrich decision-making. This is also its key role in this Scoping and Environmental Impact Assessment (EIA) process.

Interested and Affected parties (I&APs) representing the following sectors of society has been identified:

- **NATIONAL DEPARTMENTS**
  - Department of Mineral Resources and Energy;
  - Department of Water and Sanitation;

  - Department Forestry, Fisheries and the Environment;
  - Department of Agriculture, Land Reform and Rural Development;

- **LIMPOPO PROVINCIAL DEPARTMENTS**
  - Department of Agriculture and Rural Development;
  - Department of Economic Development Environment and Tourism;
  - Department of Health;
  - Limpopo Department of Cooperative Governance, Human Settlements & Traditional Affairs (COGHSTA;
  - Department of Social Development;
  - Roads Agency Limpopo;
  - Limpopo Heritage Resource Authority (LIHRA).

- **LOCAL GOVERNMENT**
  - Fetakgomo Tubatse Local Municipality;
  - Sekhukhune District Municipality;
- SAHRA;
- Agriculture, including local landowners (affected and adjacent);
- Community Based Organisations;
- Non-Governmental Organisations;
- Water bodies;
- Tourism;
- Industry and mining;
- Commerce; and
- Other stakeholders.

9.3.2 Formal Notification of the Application to Interested and Affected Parties (Including All Affected and Adjacent Landowners) and Other Stakeholders and Scoping PPP

The project was announced as follows:

Newspaper advertisement

Publication of media advertisement (English) in the Sekhukhune Times on 12 August 2021. *Proof is included in this Draft Scoping Report in Appendix 6.1.*

Site notice placement

In order to inform surrounding communities, affected and adjacent landowners of the proposed development, six site notices were erected on site and at visible locations close to the site on 12 August 2021 on the same day of the newspaper advertisement placement. *Proof is included in this Draft Scoping Report in Appendix 6.1.*

Written notification

I&AP's and other key stakeholders, which included the above-mentioned sectors, was directly informed of the proposed development by e-mail on 12 August 2021 on the same day of the newspaper advertisement placement. *Proof will be included in the Final Scoping Report in Appendix 6.2.*

Public and Open Day

A Public and Open day will be held at an accessible venue close to the surrounding communities on 25 August 2021. The Applicant and the EAP will be available at the venue from 12:00 to 17:00 to answer any questions or concerns. This will ensure that any I&AP can raise any comments or concerns in person with the Applicant and EAP. Proof will be provided in the final scoping to be submitted to the Competent Authority. *I&AP's were notified of this Public and Open day 14 days in advance. Proof will be included in the Final Scoping Report in Appendix 6.3.*

Virtual Public Meeting

A Virtual Public Meeting will be held in an electronic format (Zoom / Teams) on 25 August 2021. The meeting will take place on the day of the Public Open Day from 17:00 – 18:00. A link to the meeting will be included to the notification sent out to I&AP's during the registration period. *I&AP's were notified of this Public and Open day 14 days in advance. Proof will be included in the Final Scoping Report in Appendix 6.4.*

9.3.3 Consultation and Correspondence with I&APs and Stakeholders

All I&AP registrations and comments that are received from stakeholders will formerly recorded in a Comments and Responses Report. Proof will be provided in the final scoping to be submitted to the Competent Authority.

Hardcopies and CDs of the DSR has been submitted to all organs of state and relevant authorities on request. In addition, the Draft Scoping Report is herewith made available at the following Locations:

- Samancor Chrome ECM office, Winterveld and Tweefontein Office
- Steelpoort Post Office
- Tribal Authorities Offices (Hard & Electronic Copies):
    - ✓ Phatane
    - ✓ Bengwenyama
    - ✓ Mampuru
    - ✓ Phasha

- ✓ Malekana
- ✓ Maphopha
- ✓ Makua
- ✓ Ratau
- ✓ Maepa
- ✓ Rantho
- ✓ Masha Nkotwane
- ✓ Masha Gosebo
- ✓ Magolego

- Shaga Primary School
- Naauwpoort Lodge entrance
- Maartenshoop Police Station
- Northam/De- Brochen Main Entrance
- Booysendal - Main Entrance Gate
- Lydenburg Shoprite
- Ga – Mawela Village
- Choma Pakaneng Community
- The Mapodile Public Library and the Burgersfort Public Library;
- http://www.envass.co.za/download-documents/ (Password: #322)

I&APs are given 30 days to comment and / or raise issues of concern regarding the proposed development. Once the commenting period expires, proof will be provided in the final scoping to be submitted to the Competent Authority.

9.4 EIA PHASE OF THE PUBLIC PARTICIPATION PROCESS

All stakeholders and registered I&APs will have the opportunity to review and comment on all the documents released in the EIA phase. The EIA / EMPR report will be released for a period of 30 days for review and comment. During the EIA phase hardcopies and CDs of all reports and supporting documents will be submitted to the following relevant authorities:

- **NATIONAL DEPARTMENTS**
  - Department of Mineral Resources and Energy;
  - Department of Water and Sanitation;
  - Department Forestry, Fisheries and the Environment;
  - Department of Agriculture, Land Reform and Rural Development;

- **LIMPOPO PROVINCIAL DEPARTMENTS**
  - Department of Agriculture and Rural Development;
  - Department of Economic Development Environment and Tourism;

- Department of Health;
- Limpopo Department of Cooperative Governance, Human Settlements & Traditional Affairs (COGHSTA;
- Department of Social Development;
- Roads Agency Limpopo;
- Limpopo Heritage Resource Authority (LIHRA).

- **LOCAL GOVERNMENT**
  - Fetakgomo Tubatse Local Municipality;
  - Sekhukhune District Municipality;
- SAHRA;
- Agriculture, including local landowners (affected and adjacent);
- Community Based Organisations;
- Non-Governmental Organisations;
- Water bodies;
- Tourism;
- Industry and mining;
- Commerce; and
- Other stakeholders.

All the reports will also be made available at the following Locations:

- Samancor Chrome ECM office, Winterveld and Tweefontein Office
- Steelpoort Post Office
- Tribal Authorities Offices (Hard & Electronic Copies):
  - ✓ Phatane
  - ✓ Bengwenyama
  - ✓ Mampuru
  - ✓ Phasha
  - ✓ Malekana
  - ✓ Maphopha
  - ✓ Makua
  - ✓ Ratau
  - ✓ Maepa
  - ✓ Rantho
  - ✓ Masha Nkotwane
  - ✓ Masha Gosebo
  - ✓ Magolego

- Shaga Primary School
- Naauwpoort Lodge entrance
- Maartenshoop Police Station
- Northam/De- Brochen Main Entrance
- Booysendal - Main Entrance Gate
- Lydenburg Shoprite
- Ga – Mawela Village
- Choma Pakaneng Community
- The Mapodile Public Library and the Burgersfort Public Library;
- http://www.envass.co.za/download-documents/ (Password: #322)

All I&AP registrations and comments that are received from stakeholders will be formerly responded to and recorded in the Comments and Responses Report. Once the commenting period expires, proof will be provided in the final scoping to be submitted to the Competent Authority.

As required by the Disaster Management Act (Act No. 57 of 2002): Directions Regarding Measures to Address, Prevent and Combat the Spread of COVID-19 Relating to National Environmental Management Permits and Licences (GNR 650), the Public Participation Process plan is attached as Appendix 6.5.

9.5 SUMMARY OF ISSUES RAISED BY I&APS

All comments and responses received during the Scoping and EIA Phase public participation process will be recorded within **Table 16**. Comments received during the Scoping Phase will be included into the submission of the Final Scoping Report and the EIA Phase in the Final EIA Report being submitted to the Competent Authority for making a decision.

Table 16: Summary of issues raised – During Scoping Phase

STAKEHOLDER	CONTACT PERSON	CONTACT DETAILS	Comment(s)	Response(s)
DMR	**Thivhulawi Kolani** Sub-Directorate: Mine Environmental Managment	**Physical Copy of Scoping Submitted.** **Email:** Thivhulawi.Kolani@dmre.gov.za **Tel:** 015 287 4700 **Address:** Broll Building 101 Dorp Street Polokwane 0699		
DMR	**Tebogo Mangaba**	**Email:** Tebogo.Mangaba@dmre.gov.za **Tel:** 015 287 4700 **Address:** Broll Building 101 Dorp Street Polokwane 0699		

STAKEHOLDER	CONTACT PERSON	CONTACT DETAILS	Comment(s)	Response(s)
DMR	**Nicholas Chavalala** Mineral Regulation	**Email:** Nicholas.Chavalala@dmre.gov.za **Tel:** 015 287 4700 **Address:** Broll Building 101 Dorp Street Polokwane 0699		
DMR	**Telly Mashau**	**Email:** Telly.Mashau@dmre.gov.za **Tel:** 015 287 4700 **Address:** Broll Building 101 Dorp Street Polokwane 0699		
DWS	**Ramalisa Adam** Sub-Directorate: Water Quality Management	**Physical Copy of Scoping Submitted.** **Email:** RamalisaA@dws.gov.za **Tel:** 013 235 4206 **Address:** TPA Building Cnr Schurink and Rossouw Str Lydenburg 1120 Amzo Place 49 Joubert Street Polokwane 0700		
DFFE	**LP Makhura** Limpopo Department: Economic Development, Environment and Tourism	**Physical Copy of Scoping Submitted.** **Tel:** 015 293 8300 / 015 633 5104 / 5169 **Address:** Evridiki Towers 20 Hans van Rensburg Street Polokwane 0700		
Fetakgamo Tubatse Local Municipality	**Thabiso Mokoena** Head of communications	**Physical Copy of Scoping Submitted.** **Email:** tamokoena@tubatse.gov.za **Tel:** 013 231 1000 **Cell:** 082 447 4788 **Address:** 1 Kastania Street Burgersfort		
Fetakgamo Tubatse Local Municipality	**Thabiso Mokoena** Municipal Manager	**Tel:** 013 231 1000 **Cell:** 082 447 4788 **Address:** 1 Kastania Street Burgersfort		
Sekhukhune District Municipality	**Maureen Ntshudisane** Municipal Manager	**Physical Copy of Scoping Submitted.** **Email:** maunatlalat@sekhukhune.gov.za **Tel:** 013 262 7312 / 013 262 7300		

STAKEHOLDER	CONTACT PERSON	CONTACT DETAILS	Comment(s)	Response(s)
		Cell: 076 890 8446 **Address:** 7A Van Riebeeck Street Bareki Mall Groblersdal OF 3 Wes Street Groblersdal 0470		
Limpopo Heritage Resource Authority (LIHRA)	**Donald Lithole**	**Physical Copy of Electronic Scoping Submitted.** **Email:** litholek@sac.limpopo.gov.za **Tel:** 051 284 4000 **Adress:** Department of Sport, Arts and Culture 21 Biccard Street Polokwane 0699 Tel: 0512844000		
South African Heritage Resource Agency (SAHRA)	SAHRIS	Website Submission		
South African National Roads Agency (SANRAL)	Limpopo Department of Public Works, Roads & Infrastructure	**Email:** newsroom@dpw.limpopo.gov.za **Tel:** 015 284 7000 / 1 **Address:** 43 Church Street Polokwane 0700		
Roads Agency Limpopo (RAL)		**Email:** info@ral.co.za **Tel:** 015 284 4600 / 291 4236 **Address:** RAL Towers 26 Rabie Street Polokwane 0700		
Department of Agriculture, Land Reform & Rural Development (DALRRD)		**Email:** info@daff.gov.za / info@DALRRD.gov.za **Tel:** 012 319 6000 **Address:** Agriculture Place 20 Steve Biko street (Formerly Beatrix) Arcadia Pretoria 0002		
Limpopo Department: Agriculture and Rural Development	**M Selemela** Director Natural Resource Management	**Email:** selemelaM@agric.limpopo.gov.za **Tel:** 082 606 6346 **Address:** Temo Towers 69 Biccard Street Polokwane		

STAKEHOLDER	CONTACT PERSON	CONTACT DETAILS	Comment(s)	Response(s)
Weather SA	**Cheledi Tshehla Lunga Ngcukana**	**Email:** Cheledi.Tshehla@weathersa.co.za **Email:** Lunga.Ngcukana@weathersa.co.za		
Limpopo Department of Health (doh)	**Derrick Kganyago** Public Relations & Stakeholder Management	**Email:** Derrick.kganyago@dhsd.limpopo.gov.za **Tel:** 015 293 6000 / 53 **Address:** 18 College Street Polokwane 0700		
Limpopo Department of Cooperative Governance, Human Settlements & Traditional Affairs (COGHSTA)	**Mr. Makwela BA** Sekhukhune District	**Email:** MakwelaBA@coghsta.limpopo.gov.za **Tel:** 015 633 5589 **Cell:** 082 527 0418 **Address:** Hensa Towers Building 20 Rabe Street & 28 Market Street Polokwane 0700		
Limpopo Department of Social Development (DSD)		**Email:** info@dsd.limpopo.gov.za **Tel:** 015 230 4300 **Address:** Olympic Towers 21 Biccard Street Polokwane 0700		
Tribal Authorities in the area				
Kgosi Masha Phatane		**Physical Copy of Scoping Submitted.** Contact details available on request as per POPI.		
Kgosi Nkosi Bengwenyama		**Physical Copy of Scoping Submitted.** Contact details available on request as per POPI		
Mma Fanyane (Ga Mampuru)		**Physical Copy of Scoping Submitted.** Contact details available on request as per POPI		
Emily Rampedi (Ga Ratau)		**Physical Copy of Scoping Submitted.** Contact details available on request as per POPI		
Modecia Phasha (Ga Phasha)		**Physical Copy of Scoping Submitted.** Contact details available on request as per POPI		
Kgoshi Malekana		**Physical Copy of Scoping Submitted.** Contact details available on request as per POPI		
Kgoshi Maphopha		**Physical Copy of Scoping Submitted.** Contact details available on request as per POPI		

STAKEHOLDER	CONTACT PERSON	CONTACT DETAILS	Comment(s)	Response(s)
Kgoshi Makua		**Physical Copy of Scoping Submitted.** Contact details available on request as per POPI		
Kgoshi Ratau		**Physical Copy of Scoping Submitted.** Contact details available on request as per POPI		
Kgoshi Maepa		**Physical Copy of Scoping Submitted.** Contact details available on request as per POPI		
Kgoshi Rantho		**Physical Copy of Scoping Submitted.** Contact details available on request as per POPI		
Kgoshi Malekane		**Physical Copy of Scoping Submitted.** Contact details available on request as per POPI		
Kgoshagadi MG Masha Nkotwane		**Physical Copy of Scoping Submitted.** Contact details available on request as per POPI		
Kgoshi MJ Masha Nkotwane		**Physical Copy of Scoping Submitted.** Contact details available on request as per POPI		
Kgoshi Magolego		**Physical Copy of Scoping Submitted.** Contact details available on request as per POPI		
Masha Gosebo		**Physical Copy of Scoping Submitted.**		
Claimants / Tenants				
Ga-Mawela Village	Mathibela Mankge	**Physical Copy of Scoping Submitted.** Contact details available on request as per POPI		
Choma Pakaneng	Sam Choma	**Physical Copy of Scoping Submitted.** Contact details available on request as per POPI		
Moletsi	Kgaogelo Mohlala	Contact details available on request as per POPI		
Mankge Family Mareesburg	Charmaine Mankge	Contact details available on request as per POPI		
Leshaba Family Mareesburg	Tebogo Leshaba	Contact details available on request as per POPI		
Makua Family-Moletsane	Johannes Makua	Contact details available on request as per POPI		
Additional Copies Draft Scoping Submitted to the following areas for review				
Steelpoort Post Office		373 Radium Avenue Steelpoort 1133		
Northam Entrance Gate		Der Brochen Gate 25° 00' 14.2" S 30° 07' 17.1" E		
Booysendal		Next to Der Brochen Gate		

STAKEHOLDER	CONTACT PERSON	CONTACT DETAILS	Comment(s)	Response(s)
Main Entrance Gate				
Mareesburg Entrance Gate				
Shaga Primary School		24˚ 59' 31.3" S 30˚ 14' 05.8" E		
Maartenshoop Police Station		24˚ 59' 27.2" S 30˚ 14' 03.7" E		
Lydenburg Shoprite		43 Lange Street Lydenburg 1120		
Mapodile Public Library		24˚ 43' 52.3" S 30˚ 08' 01.9" E		
Burgersfort Public Library		Cnr. Kort & Eddie Sidebe Str. Burgersfort 1150		
Naauwpoort Lodge Entrance		25˚ 00' 42.4" S 30˚ 13' 43.1" E		

10 THE ENVIRONMENTAL ATTRIBUTES ASSOCIATED WITH THE SITES

10.1 BASELINE ENVIRONMENT

The study area falls within the Fetakgomo Tubatse Local Municipality and the Sekhukhune District Municipality, Limpopo Province.

10.2 TYPE OF ENVIRONMENT AFFECTED BY THE PROPOSED ACTIVITY

(Its current geographical, physical, biological, socio- economic, and cultural character)

10.2.1 Climate

Reference is made to Mucina, L. & Rutherford, M.C. (eds) 2006. The vegetation of South Africa, Lesotho and Swaziland. Strelitzia 19. South African National Biodiversity Institute, Pretoria.

The proposed Mareesburg Chomite Mine is located within a summer rainfall region with very dry winters. The mean annual precipitation (MAP) is approximately 500-700 mm (**Figure 7**), but the local topography influences rainfall patterns over short distances. Frost is fairly infrequent for western part of the proposed site, decreasing towards the east. Daily temperatures vary considerably at different localities, with the highest temperatures in lower-lying areas and lowest temperatures on the southern aspects of the mountains. The mean annual temperatures vary between 14.1 ˚C to 17.5 ˚C depending on where you are located (**Figure 8**).

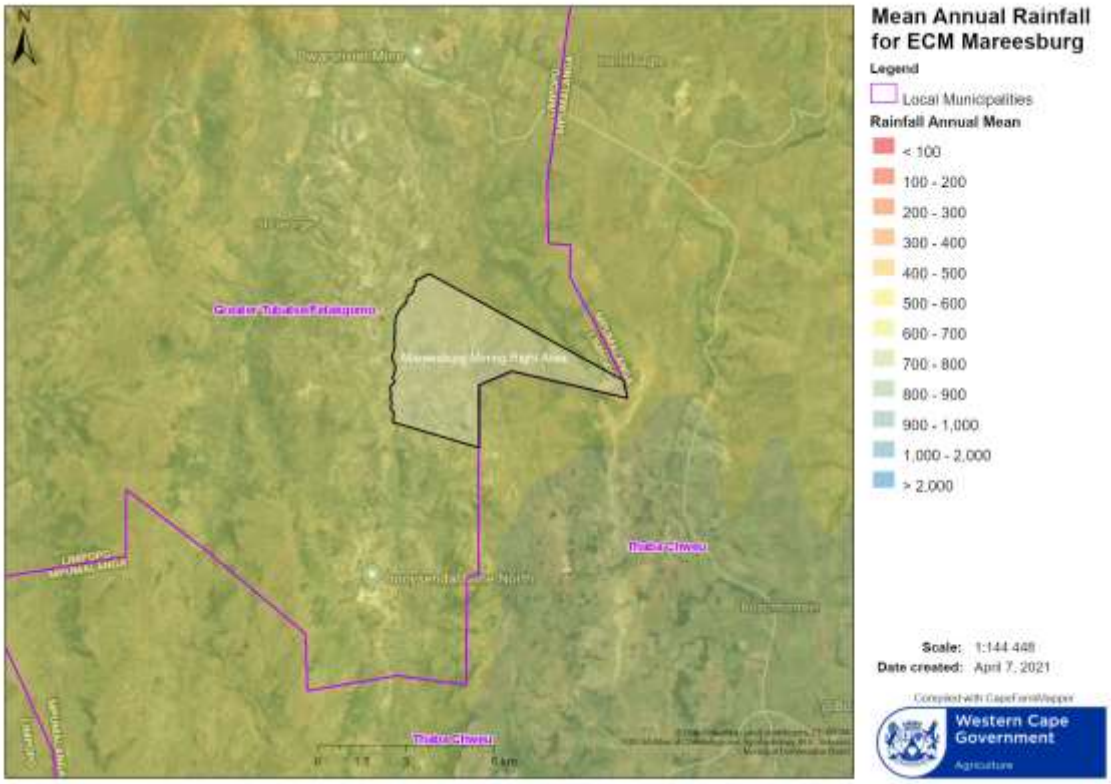


Figure 7: Mean Annual Rainfall (Cape Farm Mapper, 2021)

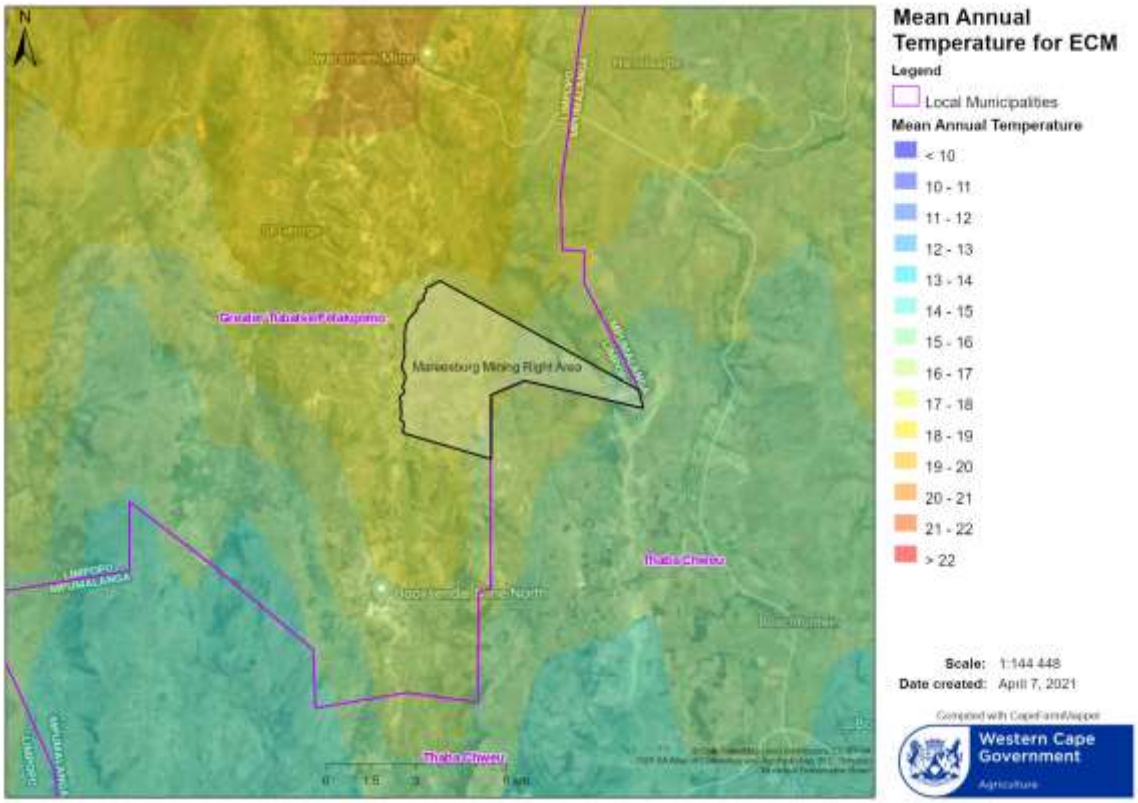


Figure 8: Mean Annual Temperature (Cape Farm Mapper, 2021)

10.2.2 Geology

Regional Setting

The Bushveld Complex is an igneous intrusive body, intruded into the Transvaal sediments. It is composed of gently steeping sheets of mafic and ultramafic rocks occupying an estimated area of 65 000km^2. The eastern limb of the Bushveld Igneous Complex can be traced for more than 150km in strike length, with various excellent exposures of outcrop of the main economic horizons, which are attenuated in part by erosion, faulting, dykes and pegmatoids. Approximately 98% of the world's chrome-ore resources are found within gabbroic-layered intrusions of which the Bushveld Igneous Complex of South Africa is the largest, measuring 240 by 480 km. Gabbroic layered intrusions are mafic to ultramafic plutonic rock bodies. The rock types range from various peridotites towards the base of the intrusion, upward through gabbro and anorthosite, to ferrogabbro and granophyric gabbro at the top. The Bushveld Igneous Complex is characterized by an overall mineralogical and chemical gradation from bottom to top of the intrusion. The chromitite seams in the Critical Zone are divided into the lower (LG1-7), the middle (MG1-4) and the upper groups (UG1-3), with the LG6, UG1 and UG2 being of greatest economic importance, for their chromite ore in the former, and PGM's in the latter. As mentioned earlier, the principal components of PGM's are mainly; Platinum, Palladium, Rhodium, Ruthenium, Iridium and Osmium.

Geological Setting of the Mareesburg Chrome Mine

The geological setting of Mareesburg Chrome Mine is situated in the eastern limb of the Bushveld Igneous Complex. The Middle Group rock types consist of pyroxenite, norite, anorthosite and chromitite layers. Of particular significance is the MG0, MG1, MG2, MG3 and MG4 chromitite seams, planned to be mined at Mareesburg Chrome Mine. At Mareesburg Chrome Mine, the MG0, MG1, MG2, MG3 and MG4 chromitite seams are separated by pyroxenite partings and disseminated chromitite layers except the parting between MG3 and MG2 separated by anorthosite.

- Occasionally, the MG4B and predominantly the MG4A seam is the topmost chromitite layer, overlying the MG4 main chromitite. The lithology between MG4 and MG4A is a norite.
- The MG3 seam is separated by a norite, and it occurs approximately 20m below the MG4. It has a leader chromitite located approximately 0.5m above the MG3
- The MG2 seams consist of three distinct chromitite layers called MG2A, MG2B and MG2C at the top. A 3m thick anorthosite (sometimes norite) layer separates the MG2 and MG3 seams. The layer between MG3 and MG3A seams is a pyroxenite.
- The MG1 chromitite seam is separated from the MG2 chromitite layer above by a 7-15m pyroxenite parting and shows variations in morphology across the farm. In places it splits and merges, with several associated footwall/hanging wall chromitite stringers.
- The MG0 is located at the base and is overlain by a 5m thick pyroxenite layer separating it from the MG1 above.

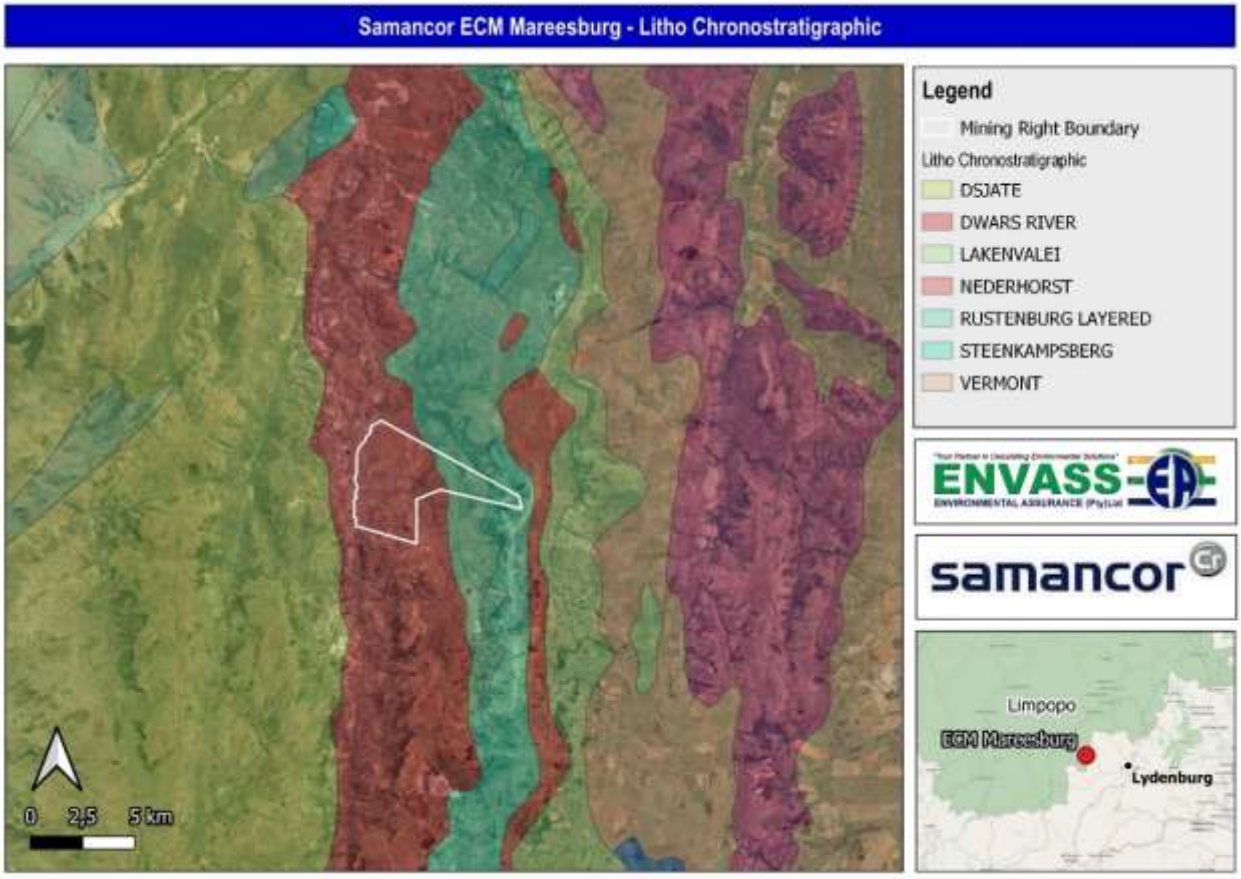


Figure 9: Geological Map of the Site Area (Cape Farm Mapper, 2021)

Geological Features

Faults: A major fault with a displacement of greater than 100 metres downthrow to the south, exist in the southern portion of the farm striking east to west. Sympathetic faulting associated with this fault is expected. Further work will be carried out to determine more characteristics of faults.

Dykes: Dykes at Mareesburg Chrome Mine have a strike from NNE-SSW and dip steeply between 60 to 90 degrees. These dykes replace some of the chromitite intersections. However caution must be taken when mining close to these dykes as bad ground conditions may be encountered. Current geological information indicates that the dykes vary in thickness from 10-15m.

Joints: The main joint direction has not been established as yet, however further work will be carried out to determine the nature of the jointing pattern at Mareesburg Chrome Mine.

Disseminated layers, stringers and parting planes: A parting plane occurs above the MG1 chrome seam in isolated areas. The parting plane is situated between 20cm - 35cm above the MG1 chrome seam.

Pegmatite intrusions: Ground conditions at Mareesburg Chrome Mine will be affected negatively in several places by pegmatite intrusions or iron replacement ultramafic pegmatoids (IRUPs) as intersected on some surface exploration boreholes. These pegmatoids sometimes replace larger sections of the stratigraphy.

Domes: It is still not known whether doming is present at Mareesburg Chrome Mine, however further work will be carried out to determine the nature of any doming if it does indeed exist at Mareesburg Chrome Mine.

Potholes/Reef Rolls: It is still not known whether potholes or reef rolls are present at Mareesburg Chrome Mine, however further work will be carried out to determine the nature of any potholes or reef rolls if they does indeed exist at Mareesburg Chrome Mine.

10.2.3 Soil

Reference is made to Mucina, L. & Rutherford, M.C. (eds) 2006. The vegetation of South Africa, Lesotho and Swaziland. Strelitzia 19. South African National Biodiversity Institute, Pretoria.

Soils located in the Sekhukhune Mountain Bushveld to the west of the site are predominantly shallow, rocky and clayey. Glenrosa and Mispah soil forms are common, with lime present in low-lying areas. Rocky areas without soil are common on steep slopes. The Dwars River Valley is characterised by prismacutanic horizons with melanic structured diagnostic horizons. Around Steelpoort red apedal, freely drained soils occur and these deeper soils include Hutton, Bonheim and Steendal soil forms. Land types mainly Ib, Ae, Ic and Fb.

Soils located in the Sekhukhune Montane Grassland to the middle of the site contains miscellaneous soil types and those of the southern plains have diagnostic horizons that are vertic, melanic or red-structured. Dominant soil forms have a high clay content and include Arccadia, Mayo, Milkwood, Mispah, Shortlands and Steendal. Ea land type covers 40% of the area, with minor occurrences of Ib and Ab.

A small section on the east of the proposed Mareesburg Chrome site forms part of the Lydenburg Montane Grassland vegetation unit. The soils are mostly derived from shale and quartzite as well as lavas and dolomites of the Pretoria Group of the Transvaal Supergroup (Vaalian Erathem). Land types Ac and Fa cover areas of approximately equal size.

10.2.4 Land Capability

Land capability (**Figure 10** overleaf), as defined in the Chamber of Mines Guidelines for Rehabilitation of Mined Land, is based on soil depth. The Chamber of Mines recommends that land be rehabilitated to at least the standard that existed before mining.

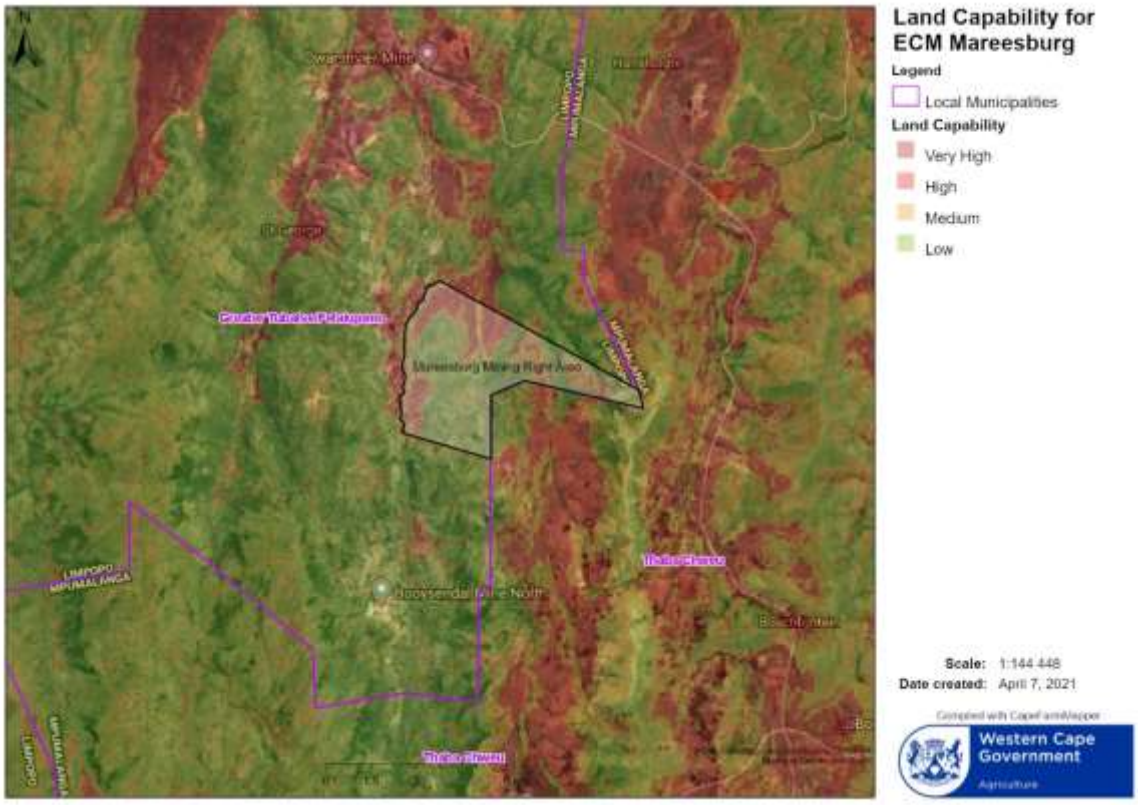


Figure 10: Land Capability of the Mareesburg site and Surrounds

Land Use

The current land use on site (surface infrastructure area) is communal agriculture. Based on the ENPATT database the land use is classified as Vacant / Unspecified and Subsistence farming. The land uses around the site include cultivated lands, townships, rural residential areas, and natural hills. In the larger area several mines have been established and infrastructure associated with chrome and platinum mines. **Figure 11** shows the agricultural enterprise areas which the mining area falls within.

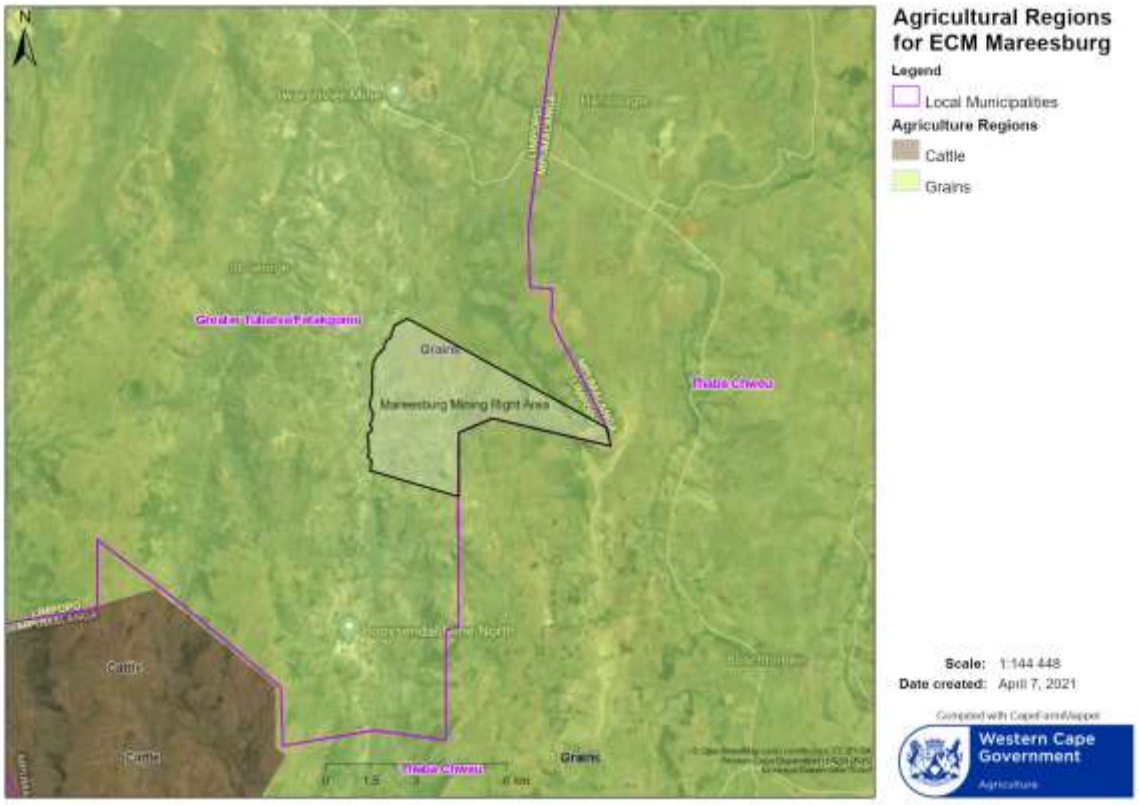


Figure 11: Agricultural Enterprises (Cape Farm Mapper, 2021)

10.2.5 Vegetation

Reference is made to Mucina, L. & Rutherford, M.C. (eds) 2006. The vegetation of South Africa, Lesotho and Swaziland. Strelitzia 19. South African National Biodiversity Institute, Pretoria.

The proposed Mareesburg Chrome Mine site falls within three vegetation units, namely the Sekhukhune Montane Grassland, the Sekhukhune Montane Grassland and the Lydenburg Montane Grassland as displayed in **Figure 12**. The economic uses of this vegetation type include cattle and grain farming as indicated in **Figure 11**.

The Four principal vegetation units that were identified in the area are listed in **Table 17** below:

Table 17: Vegetation Types identified for the ECM Mareesburg Chrome Mine site

VEGETATION TYPE	DESCRIPTION
Sekhukhune Mountain Bushveld (SVcb 28)	Dry, open to closed microphyllous and broad-leaved savanna on hills and mountain slopes that form concentric belts parallel to the northeastern escarpment. Open bushveld often associated with ultramafic soils on southern aspects. Bushveld often associated with ultramafic soils on southern aspects. Bushveld on ultramafic soils contain a high diversity of edaphic specialists. Bushveld of mountain slopes generally taller than in the valleys, with a well-developed herb layer. Bushveld of valleys and dry northern aspects usually dense, like thicket, with a herb layer comprising many short-lived perennials. Dry Habitats contain a number of species with xerophytic adaptations, such as succulence and underground storage organs.

VEGETATION TYPE	DESCRIPTION
	Both man-made and natural erosion dongas occur on footslopes of clays rich in heavy metals.
Lydenburg Montane Grassland (Gm 18)	High-altitude plateaus, undulating plains, mountain peaks and slopes, hills and deep valleys of the Northern Escarpment region, supporting predominantly very low grasslands on the high-lying areas. Height of the grass sward increases on the lower slopes. The grassland is very rich in forb species.
Sekhukhune Montane Grassland (Gm 19)	Major chains of hills transect the area and have a north-south orientation, creating moderately steep slopes with predominantly eastern and western aspects. Large norite boulders and stones cover the shallow soils on the hillsides. Dense, sour grassland occur on slopes of mountains and undulating hills, with scattered clumps of trees and shrubs in sheltered habitats. Turf and clay soils characterise the open plains between the chains of hills and culminate in a open plain in the Stoffberg area. Dense, tall grassland is found on the plains and encroachment by indigenous or invasion by alien microphyllous tree species is common in places.

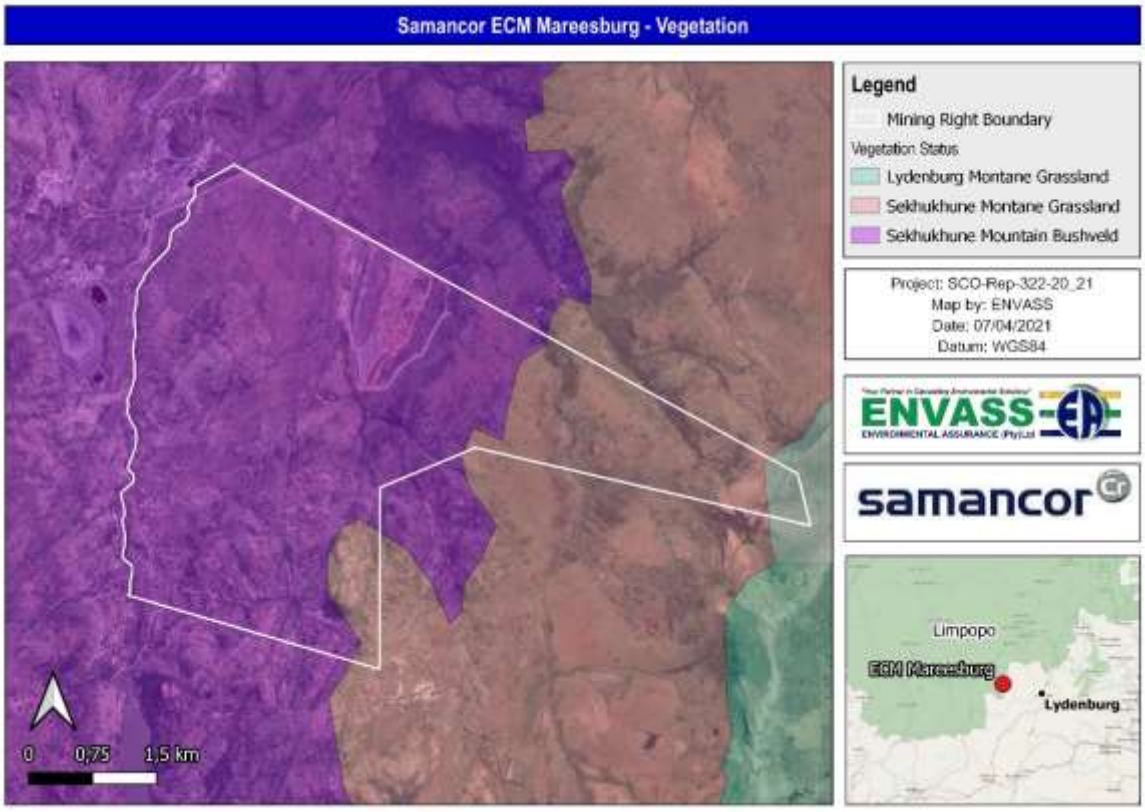


Figure 12: Vegetation map for the ECM Mareesburg Chrome Mine (ENVASS, 2021)

Conservation Status

The following conservation classes were encountered in the study area and are listed below in **Table 18** below.

Table 18: Classes of conservation

VEGETATION TYPE	Conservation Status
Sekhukhune Mountain Bushveld (SVcb 28)	Least threatened. Target 24%. None conserved in statutory conservation areas, but 0.4% conserved in Potlake Nature Reserve. Nearly 15% transformed, mainly by cultivation and urban built-up. Erosion is at moderate to high levels, with donga formation in places. An increasing area along the Dwars River Subsuite is under pressure from mining activities and its associated urbanisation (Siebert et al. 2002d). *Melia azedarach* is currently the most aggressive alien invader.
Lydenburg Montane Grassland (Gm 18)	Vulnerable. The conservation target is 27%, with 2.4% formally protected within reserves (Gustav Klingbiel, Makobulaan, Mt Anderson, Ohrigstad Dam, Sterkspruit and Verlorenvlei) as well as in a number of private conservation areas (Buffelskloof, Crane Creek, ETTC, In-de-Diepte, Kaalboom, Kalmoesfontein, Mbesan, Mondi Indigenous Forest, Mt Sheba, Waterval etc.). The level of transformation is relatively high at 23%, with mostly alien plantations (20%) and cultivated lands (2%). Erosion potential very low (74%) and low (12%).
Sekhukhune Montane Grassland (Gm 19)	Vulnerable. Conservation target 24%. Approximately 30% of this area is under commercial or subsistence cultivation. Vast areas are mined for vanadium using strip mining, and in recent years minng of gabbro has increased substantially (Siebert et al. 2002c). There is no formal conservation in the region, although many farmers have embarked on ecotourism initiatives. Erosion very low (56%), moderate (18%) and high (16%).

Important Taxa

Important Taxa for each vegetation type are listed in **Table 19** below.

Table 19: List of important taxa for each vegetation type

VEGETATION TYPE	Important Taxa
Lydenburg Montane Grassland (Gm 18)	Small Trees: *Protea roupelliae subsp. roupelliae (d), Faurea galpinii.* Low Shrubs: *Phymaspermum acerosum (d), Anthospermum rigidum subsp. rigidum, Cliffortia repens, Erica cerinthoides, E. woodii, Felicia filifolia subsp. filifolia, Gnidia caffra, Helichrysum odoratissimum, H. swynertonii, Heteromorpha involucrata, Polygala uncinata, Tenrhynea phylicifolia.* Succulent Shrubs: *Lopholaena disticha (d), Delosperma lydenburgense.* Graminoids: *Andropogon schirensis (d), Aristida junciformis subsp. Galpinii (d), Brachiaria serrrata (d), Digitaria monodactyla (d), D. tricholaenoides (d), Diheteropogon filifolius (d), Harpochloa faix (d), Heteropogon contortus (d), Hyparrhenia hirta (d), Loudetia simplex (d), Monocymbium ceresiiforme (d), Setaria nigrirostris (d), Sporobolus centrifugus (d), Themeda triandra (d), Trachypogon spicatus (d), Tristachya leucothrix (d), Alloteropsis semialata subsp. eckloniana, Aristida sciurus, Bulbostylis oritrephes, Ctenium consinnum, Cymbopogon caesius, Diheteropogon amplectens, Elionurus muticus, Eragrostis capensis, E. chloromelas, E. curvula, E. gummiflua, E. plana, E. racemose, E. sclerantha, Eulalia villosa, Ischyrolepis schoenoidis, Koeleria capensis, Microchloa caffra, Panicum ecklonii, P. natalense, Pentaschistis natalensis, Rendlia altera, Schizachyrium sanguineum, Sporobolus pectinatus, Tristachya rehmannii.* Herbs: *Senecio gerrardii (d), Acalypha angustata, A. depressinerva, Alepidea longifolia, Dicoma anomala, Dimorphotheca jucunda, D. spectabilis, Eriosema kraussianum, Gerbera ambigua, Haplocarpha scapose, Helichrysum caespititium, H. chionosphaerum, H. nudifolium H. rugulosum, H. spiralepis, H. subglomeratum,*

VEGETATION TYPE	Important Taxa
	H. umbraculigerum, Monopsis decipiens, Myosotis afropalustris, Pelargonium luridum, Pentanisia prunelloides subsp. latifolia, Polygala amatymbica, Psammotropha myriantha, Rhynchosia monophyla, Schistostephium crataegifolium, Sebaea erosa, S. sedoides var. confertiflora, Selago procera, Senecio laevigatus, Vemonia hirsuta, V. natalensis, V. oligocephala, Wahlenbergia undulata, Zomia capensis. Herbacious Climber: *Rhynchosia totta.* Geophytic Herbs: *Gladiolus longicollis subsp. platypetalus (d), Agapanthus inapertus subsp. inapertus, A. inapertus subsp. intermedius, Chlorophytum haygarthii, Corycium dracomontanum, C. Nigrescens, Disa fragrans subsp. fragrans, D. versicolor, Disperis renibractea, Gladiolus ecklonii, Habenaria dives, H. dregeana, H. lithophila, Haemanthus humilis subsp. hirsutus, Holothrix scopularia, Hypoxis costata, H. galpinii, H. rigidula var. pilosissima, Merwilla natalensis, Pachycarpus transvaalensis, Raphionacme galpinii, Satyrium longicauda, Zantedeschia albomaculata subsp. macrocarpa.* Succulent Herbs: *Aloe dyeri, A. graciliflora, A. longibracteata, Crassula vaginata.*
Sekhukhune Mountain Bushveld (SVcb 28)	Tall Tree: Acacia nigrescens. Small Trees: *Acacia senegal var. leiorhachis (d), Combretum apiculatum (d), Kirkia wilmsii (d), Terminalia prunioides (d), Vitex obovata subsp. wilmsii (d) Ziziphus mucronata (d), Bolusanthus speciosus, Boscia albitrunca, Brachylaena ilicifolia, Combretum molle, Commiphora mollis, Croton gratissimus, Cussonia transvaalensis, Hippobromus pauciflorus, Ozoroa sphaerocarpa, Pappea capensis, Schotia latifolia, Sterculia rogersii.* Succulent Tree: *Aloe marlothii subsp. marlothii.* Tall Shrubs: *Dichrostachys cinerea (d), Euclea crispa subsp. crispa (d), Combretum hereroense, Euclea linearis, Pavetta zeyheri, Tinnea rhodesiana, Triaspis glaucophylla.* Low Shrubs: *Elephantorrhiza praetermissa (d), Grewia vernicosa (d), Asparagus intricatus, Barleria saxatilis, B. senensis, Clerodendrum ternatum, Commiphora africana, Hermannia glanduligera, Indigofera lydenburgensis, Jatropha latifolia var. angustata, Melhania prostrata, Phyllanthus glaucophyllus, Psiadia punctulata, Rhus keetii, Rhynchosia komatiensis.* Succulent Shrubs: *Aloe castanea (d), A. cryptopoda (d).* Woody Climbers: *Clematis brachiata (d), Rhoicissus tridentata (d), Acacia ataxacantha.* Woody Succulent Climber: *Sarcostemma viminale.* Graminoids: *Aristida canescens (d), Heteropogon contortus (d), Panicum maximum (d), Setaria sphacelata.* Herbs: *Berkheya insignis (d), Commelina africana (d), Cyphostemma woodii, Kyphocarpa angustifolia, Senecio latifolius.* Geophytic Herbs: *Hypoxis rigidula, Sansevieria hyacinthiodes.* Succulent Herb: *Huernia stapelioides.*
Sekhukhune Montane Grassland (Gm 19)	Small Trees: *Protea caffra subsp. caffra (d), Acacia caffra, Apodytes dimidiata subsp. dimidiata, Canthium suberosum, Cussonia transvaalensis, Seemannaralia gerrardii.* Woody Climbers: *Rhoicissus tridentata (d), Jasminum quinatum, Triaspis glaucophylla.* Tall Shrubs: *Euclea crispa subsp. crispa (d), Brachylaena ilicifolia, Diosphyros austro-africana, Euclea linearis, Pavetta zeyheri.*

VEGETATION TYPE	Important Taxa
	Low Shrubs: *Gnidia caffra (d), Senecio microglassus (d), Dyschoriste rogersii, Elephantorrhiza praetermissa, Leonotis leonurus, Polygala uncinata, Rhus discolor, R. tumulicola var. meeuseana, R. wilmsii.* Geoxylic Suffrutex: *Elephantorrhiza elephantina.* Graminoids: *Aristida junciformis subsp. galpinii (d), Diheteropogon amplectens (d), E. racemosa (d), Heteropogon contortus (d), Microchloa caffra (d), Monocymbium ceresiiforme (d), Setaria sphacelata (d), Themeda triandra (d), Tristachya leucothrix (d), Andropogon schirensis, Aristida aequiglumis, Brachiaria serrata, Cymbopogon caesius, Digitaria diagonalis, D. monodactyla, Ehrharta capensis, Eragrostis capensis, E. nindensis, E. plana, Hyparrhenia hirta, Loudetia simplex, Panicum natalense, Setaria nigrirostrus, Trachypogon spicatus, Triraphis andropogonoides.* Herbs: *Acalypha punctata (d), Berkheya setifera (d), Rotheca hirsuta (d), Senecio latifolius (d) Tephrosia purpurea subsp. leptostachya (d), Berkheya insignis, Gerbera jamesonii, Helichrysum nudifolium var. nudifolium, Ipomoea crassipes, Jamesbrittenia silenoides, Macledium zeyheri subsp. argyrophylum, Pegolettia lanceolata, Pentanisia prunelloides subsp. prunelloides, Senecio coronatus, Vemonia galpinii, V. natalensis, V. oligocephala, Xerophyta retinervix.* Geophytic Herbs: *Hypoxis rigidula var. pilosissima (d), Cheilanthes hirta, Eucomis montana, Hypoxis rigidula var. pilosissima (d), Cheilanthes hirta, Eucomis montana, Hypoxis hemerocallidea, Pachycarpus transvaalensis.* Succulent Herb: *Kleinia stapeliiformis.*

Endemic Taxa

Important Taxa for each vegetation type are listed in **Table 20** below.

Table 20: List of endemic taxa for each vegetation type

VEGETATION TYPE	Endemic Taxa
Lydenburg Montane Grassland (Gm 18)	Low Shrubs: *Erica atherstonei, E. holtii, Helichrysum lesliei, H. summo-montanum.* Succulent Shrub: *Khadia alticola.* Herbs: *Crotalaria monophylla, Cymbopappus piliferus, Knowltonia transvaalensis var. pottiana, Pearsonia hirsuta, Streptocarpus cyaneus subsp. Longi-tommii, S. hilburtianus.* Geophytic Herbs: *Disa alticola, D. amoena, D. clavicornis, Eucomis vandermerwei, Gladiolus cataractarum, G. exiguus, G malvinus, Kniphofia rigidifolia, Riocreuxia aberrans, Schizochilus cecilii subsp. transvaalensis, S. lilacinus, Watsonia occulta, W. wilmsii.* Succulent Herb: *Crassula setulosa var. deminuta*
Sekhukhune Mountain Bushveld (SVcb 28)	Small Tree: *Acacia ormocarpoides..* Succulent Tree: *Euphorbia sekukuniensis.* Soft Shrub: *Plectranthus porcatus.*
Sekhukhune Montane Grassland (Gm 19)	Succulent Shrubs: *Aloe reitzii var. reitzii, Delosperma deilanthoides.* Geophytic Herbs: *Resnova sp. nov. ('megaphylla'), Zantedeschia pentlandii.*

10.2.6 Fauna

Avifaunal Specie Composition

Birds can be good ecological indicators. Bird communities and ecological conditions are associated with land cover; so, as the land cover changes, so too do the communities of birds in the area. The study area could yield several birds found on the Red Data List (RDL), however only one RDL species was observed during a site survey in 2017, and only three have been recorded in the Quarter Degree Grid Cell (QDGD) in which the study site is located.

Almost 200 species of birds have been recorded in the Sekhukhuneland area (South African Bird Atlas Project 2). During a survey in 2017, a total of 13 bird species were observed and recorded within the study site. The Sekhukhune Mountain Bushveld, riparian habitat and wetland areas were observed to have the highest species richness and abundance; sightings of Spotted Eagle Owl, Little Bee-eater, Crested Barbet, Dark Capped Bulbul and Steppe Buzzard were recorded. Along the banks of the river and in the riverine vegetation were Cut Throat Finch, Red Billed Queleas, Red Faced Mousebird, Amethyst sunbird and Fork Tailed Drongo. The wetland area had typically common wetland species such as Malachite Kingfisher, Southern Red Bishop and White Winged Widowbird.

Avifaunal species of concern

The Black Stork (*Ciconia nigra*) is the only RDL species observed during the survey in 2017. Black Stork forage in lakes, rivers and estuaries and breed on cliff ledges. Back Stork may likely use the streams and wetlands to forage, however, because of a for lack of suitable cliffs, this species would not breed here.

The following avifaunal species, recorded on SABAP2 in the QDGC in which the proposed Mareesburg mine is located, are considered species of special concern (**Table 21**). Cape Vulture are dependent on availability of food and will only occur if it is available. No suitable cliffs were seen within the study site where Cape Vulture could breed. Also since these birds have wide foraging ranges, the proposed mine is unlikely to affect this species. The Secretary Bird are mostly restricted to large conservation areas and tend to avoid densely wooded and mountainous areas. Secretary Birds are likely to move over the study site, but unlikely to forage or breed in the study site. White bellied Bustard recorded in the area were most likely a rare or vagrant sighting. This rare bird is resident to the grasslands in Northern Namibia and would not likely breed in the dense Sekhukhune Mountain Bushveld.

Table 21: Avifaunal species of special concern recorded within 2530AA Quarter Degree Grid Cell (SABAP2, IUCN, 2014)

Common Name	Species	Red Data List Status
Black Stork	*Ciconia nigra*	Near Threatened
White-bellied Bustard	*Eupodotis senegalensis*	Unknown
Secretarybird	*Sagittarius serpentarius*	Vulnerable
Cape Vulture	*Gyps coprotheres*	Vulnerable

Mammal species composition

According to distribution maps, there are a possible 28 mammal species that may occur within the proposed study area (Skinner and Chimimba 2005; South African MammalMap 2014). Some of these mammal species are highly sensitive to habitat, and therefore the likelihood of them occurring within the study site is minimal. According to literature on the area, key species include: Pangolin (*Smutsia temminckii*), Spotted necked Otter (*Hydrictis maculicollis*), the South African hedgehog (*Atelerix frontalis*), Juliana's Mole (*Neamblysomus julianae*) and Gunning's Golden Mole (*Neamblysomus gunningi*) (Patton *et al*., 2015) and Serval (*Leptailurus serval*) and Brown Hyena (*Hyaena brunnea*), have been recorded in the QDGC according to the South African Mammal Map.

Relatively unspoilt habitat exists within the area which has been proposed for the mine, and although the presence of most of these species was not confirmed, this ecologically good area is likely to support these species (**Table 22**).

Table 22: A list of probable mammal species within 2530AA Quarter Degree Grid Cell (QDGC) according to the South African Mammal Map

Mammals	Conservation Status	Habitat
Impala	Least Concern	Savannah, grasslands, woodlands
Aepyceros melampus		
Klipspringer	Least Concern	Rocky outcrops, mountains
Oreotragus oreotragus		
Steenbok	Least Concern	Wide range
Raphicerus campestris		
Mountain Reedbuck	Least Concern	Ridges and rocky hillsides
Redunca fulvorufula		
Common Duiker	Least Concern	Everywhere there is good cover
Sylvicapra grimmia		
Black-backed Jackal	Least Concern	Wide range
Canis mesomelas		
Cape Fox	Least Concern	Areas with sparse vegetation
Vulpes chama		
Caracal	Least Concern	Dry areas with cover
Caracal caracal		
Serval	**Near Threatened**	Wetlands, grasslands
Leptailurus serval		
Leopard	Least Concern	Wide range
Panthera pardus		
Brown Hyena	**Near Threatened**	Desert, savannah, grassland
Hyaena brunnea		
Short-snouted Elephant Shrew	Least Concern	Savannah, grassland
Elephantulus brachyrhynchus		
Eastern Rock Elephant Shrew	Least Concern	Rocky outcrops
Elephantulus myurus		
Southern African Spiny Mouse	Least Concern	Rocky outcrops, savannah woodland
Acomys spinosissimu		
Tete Veld Aethomys		

Mammals	Conservation Status	Habitat
Aethomys ineptu	Least Concern	Bushveld, woodland
Namaqua Rock Mouse *Aethomys namaquensis*	Least Concern	Wide distribution
Bushveld Gerbil *Gerbilliscus leucogaster*	Least Concern	Bushland
Single-Striped *Lemniscomys rosalia*	Least Concern	Wide range with tall grass
Natal Mastomys *Mastomys natalensis*	Least Concern	Wide range including urban
Southern African Pygmy Mouse *Mus minutoide*	Least Concern	Grasslands, savannah
Angoni Vlei Rat *Otomys angoniensis*	Least Concern	Grasslands, savannah
Acacia Rat *Thallomys paedulcus*	Least Concern	Shrubland
Gray African Climbing Mouse *Dendromus melanotis*	Least Concern	Grasslands, savannah
Southern African Pouched Mouse *Saccostomus campestris*	Least Concern	Savannah woodland, rural gardens
Lesser Red Musk Shrew *Crocidura hirta*	Least Concern	Grassland, savannah, bushveld
Lesser Gray-brown Musk Shrew *Crocidura silacea*	Least Concern	Wide range of habitats
Lesser Dwarf Shrew *Suncus varilla*	Least Concern	Termite mounds, savannah, grasslands
Common Warthog *Phacochoerus africanus*	Least Concern	Grassland, savannah, woodland

Several mammals were seen during the survey in 2017. Spoor and dung encountered in the Sekhukhune Mountain Bushveld indicated the presence of several small to medium sized mammal species (namely Common Duiker (*Sylvicapra grimmia*), Rock Hyrax (*Procavia capensis*) and Klipspringer (*Oreotragus oreotragus*)). Chacma baboon (*Papio ursinus*), Kudu (*Tragelaphus strepsiceros*), Impala (*Aepyceros melampus*), Blue Wildebeest (*Connochaetes taurinus*) and Giraffe (*Giraffa spp.*) were observed during the site visit.

Amphibian species composition

A total of 13 frog species have been recorded within the Quarter Degree Grid Cell 2530AA according to the South African Frog Atlas Project (SAFAP) (**Table 23**). Common species which may occur within the wetland areas, drainage lines and riparian habitat close to the proposed mine and required roads include Bushveld Rain Frog (*Breviceps adspersus*), Raucous Toad (Amietophrynus *rangeri*), Painted Reed Frog (*Hyperolios marmaratus*), and Guttural Toad (*Amietophrynus gutturalis*), none of which are considered to be threatened species (NW SoER, 2002). Many frogs may make use of drier areas, where they will bury themselves and not be seen until after good rains. They may also come out to find permanent water sources to breed. It is likely that the bushveld has populations of Bushveld Rain Frog (*Breviceps adspersus*), Red Toad

(*Schismaderma carens*) and Broadbanded Grass Frog (*Ptychadena mossambica*). No species of concern were recorded on in the study area according to SAFAP.

Table 23: A list of probable amphibian species recorded within the 2530AA Quarter Degree Grid Cell (QDGC) according to the South African Frog Atlas Project (SAFAP)

Frogs	Conservation Status	Habitat
Bushveld Rain Frog *Breviceps adspersus*	Least Concern	Savannah, Woodland
Guttural Toad *Amietophrynus gutturalis*	Least Concern	Wide range
Flatbacked Toad *Amietophrynus maculatus*	Least Concern	Wide range
Raucous Toad *Amietophrynus rangeri*	Least Concern	Forest, savannah
Red Toad *Schismaderma carens*	Least Concern	Savannah, Shrubland
Painted Reed Frog *Hyperolius marmoratus*	Least Concern	Wetlands, forest
Bubbling Kassina *Kassina senegalensi*	Least Concern	Savannah, Shrubland, grassland, forest
Snoring Puddle Frog *Phrynobatrachus natalensis*	Least Concern	Forest, savannah
Plain Grass Frog *Ptychadenas anchietae*	Least Concern	Savannah, Shrubland, grassland, forest
Broadbanded Grass Frog *Ptychadena mossambica*	Least Concern	Savannah, Forest, grassland
Common River Frog *Amietia quecketti*	Least Concern	Grassland
Clicking Stream Frog *Strongylopus grayii*	Least Concern	Wetlands
Natal Sand Frog *Tomopterna natalensis*	Least Concern	Savannah, grassland

Amphibians are good indicators of changes to an ecosystem as they are sensitive to changes in both the aquatic and terrestrial ecosystem (Branch, 1998). Only the Common River frog (*Afrana angolensis*) were observed during the survey in 2017. Amphibian species richness and abundance are particularly sensitive to pollution due to their bi-phasic lifestyle and semi permeable skin. Amphibian species are susceptible to the possible deterioration of water quality around the human inhabited area which could have resulted in their decline. It is possible for some of the sand frog and toad species to occur on site within the Sekhukhune Mountain Bushveld, due to their hibernation habits.

Reptile species composition

According to the SARCA (South African Reptile Conservation Assessment) database, 33 reptiles have been recorded within the 2530AA Quarter Degree Grid Cell (SARCA, IUCN, 2014). According to literature, the species of concern are: Soutspansberg Flat Lizard (*Platysaurus relictus*), South African Rock Python (*Sebae natalensis*), Swazi Rock Snake (*Lamprophis swazicus*) and Variegated Wolf Snake (*Lycophidion variegatum*) (Desmet *et al*., 2013; van Staden *et al*., 2014). These snake species have a high chance of occurring within the study area as they inhabit rocky outcrops and well wooded rocky valleys.

The Soutspansberg Flat Lizard is listed as Near Threatened due to its restricted range, but it is common where it occurs and not under any specific threat at present (Alexander and Marais, 2008). The South African Rock Python is protected by the Limpopo Environmental Management Act and likely occurs in the Sekhukhune Mountain Bushveld within the study area and the surrounding areas.

Table 24: A probable list of reptile species recorded within the 2530AA Quarter Degree Grid Cell (QDGC) according to the South African Reptile Conservation Assessment (SARCA)

Reptiles	Conservation Status	Habitat
Southern Tree Agama *Acanthocercus atricollis*	Least Concern	Savannah, forest
Distant's Ground Agama *Agama aculeata*	Least Concern	Forest
Southern Rock Agama *Agama atra*	Least Concern	Forest, grassland, scrubland
Wolkberg Dwarf Chameleon *Bradypodion transvaalense*	Least Concern	Forest
Common Flap-neck Chameleon *Chamaeleo dilepis*	Least Concern	Forest, savannah, woodlands, grasslands
Eastern Tiger Snake *Telescopus semiannulatus*	Least Concern	Forest, savannah, desert, scrubland
Soutpansberg Flat Lizard *Platysaurus relictus*	**Near Threatened**	Rocky outcrops
Sekhukhune Flat Lizard *Platysaurus orientalis*	Least Concern	Savannah
Sekhukhune Flat Lizard subspp. *Platysaurus orientalis fitzsimons*	**Near Threatened**	Savannah
Van Dam's Girdled Lizard *Smaug vandami*	Least Concern	Rocky, grassland
Mozambique Spitting Cobra	Least Concern	Savannah, forest

Reptiles	Conservation Status	Habitat
Naja mossambica		
Sekhukhuneland Flat Gecko *Afroedura leoloensis*	Not listed	Savannah, desert
Turner's Gecko *Chondrodactylus turneri*	Least Concern	Desert
Common Dwarf Gecko *Lygodactylus capensis*	Least Concern	Woodlands, forest
Van Son's Gecko *Pachydactylus vansoni*	Least Concern	Savannah
Common Giant Plated Lizard *Matobosaurus validus*	Least Concern	Savannah, grassland
Bushveld Lizard *Heliobolus lugubris*	Least Concern	Savannah
Common Rough-scaled Lizard *Meroles squamulosus*	Least Concern	Savannah
Holub's Sandveld Lizard *Nucras holubi*	Least Concern	Savannah, desert
Ornate Sandveld Lizard *Nucras ornata*	Least Concern	Savannah
Brown House Snake *Boaedon capensis*	Least Concern	Wide range
Black File Snake *Gonionotophis nyassae*	Least Concern	Forest, savannah, woodlands, grasslands
Short-snouted Grass Snake *Psammophis brevirostris*	Least Concern	Grassland, desert
Western Yellow-bellied Sand Snake *Psammophis subtaeniatus*	Least Concern	Savannah
Striped Grass Snake *Psammophis tritaeniatus*	Least Concern	Grassland, savannah
Jacobsen's Thread Snake *Leptotyphlops jacobseni*	Least Concern	Grassland, savannah
Southern African Rock Python *Python natalensis*	**Vulnerable (Limpopo)**	Savannah, forest
Cape Skink *Trachylepis capensis*	Least Concern	Grassland, savannah
Rainbow Skink	Least Concern	Savannah

Reptiles	Conservation Status	Habitat
Trachylepis margaritifer		
Variable Skink *Trachylepis varia*	Least Concern	Grasslands
Leopard Tortoise *Stigmochelys pardalis*	Least Concern	Grasslands
Delalande's Beaked Blind Snake *Rhinotyphlops lalandei*	Least Concern	Savannah, fynbos, desert
Puff Adder *Bitis arietans*	Least Concern	Grassland, savannah
Snouted Night Adder *Causus defilippii*	Least Concern	Savannah, forest

All reptilian species are sensitive to habitat modification and fragmentation. Due to the natural state of the vegetation and the close proximity to the river, it is predicted that most reptile species would be in the mountains and the potential mining site and associated infrastructure.

Four reptile species were recorded during the survey, namely Brown House Snake (*Boaedon capensis*), Sekhukhune Flat Lizard (*Platysaurus Spp*), Variable Skink (*Trachylepis Mabuya varia*), Southern Rock Agama (*Agama atra*) and Leopard Tortoise (*Stigmochelys pardalis*).

With an increase in the number of roads and traffic, through the Sekhukhune Mountain Bushveld, small, slow moving reptile species, will become even more vulnerable to being run over by vehicles, while moving from one area to another

10.2.7 Geohydrology

Mareesburg is located approximately 30 km South of the town of Steelpoort and consists of various portions which are owned by various companies. The site is located in the Olifants (B4) Water Management Area (WMA), in the B41G quaternary catchment area (**Figure 13** below). Other major mining operations within the area include those of Anlgo American-and Eastplats Ltd mines.

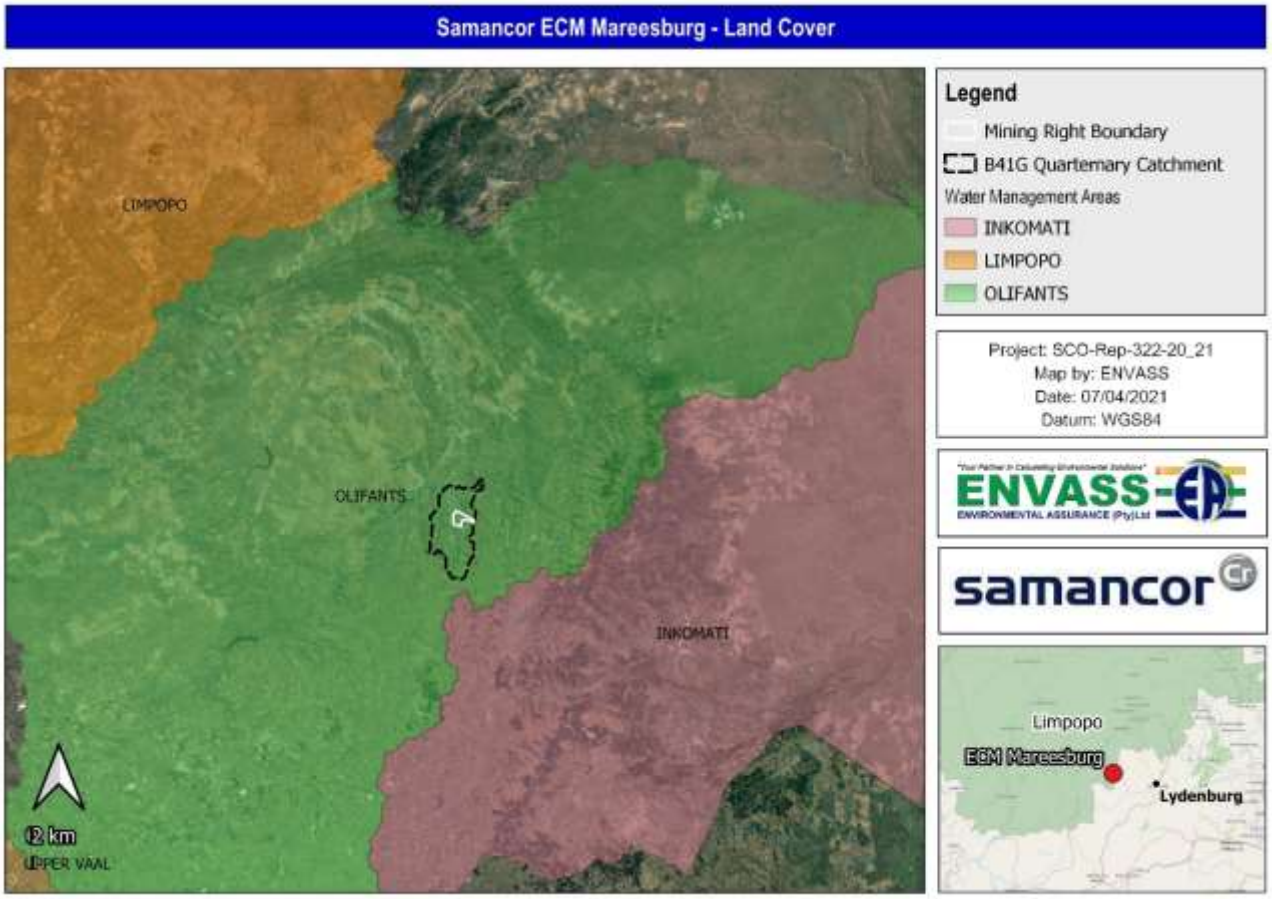


Figure 13: Catchment Area (Cape Farm Mapper, 2020)

The Mareesburg mining area indicates a mountainous area with topography varying between 1045 mamsl (western corner of the site) and 1275 mamsl (near the center of the site) as indicated in **Figure 14**. The site area includes various pristine mountain streams which drain to the Groot Dwars River (West of the site) and the Klein Dwars River (East of the site).

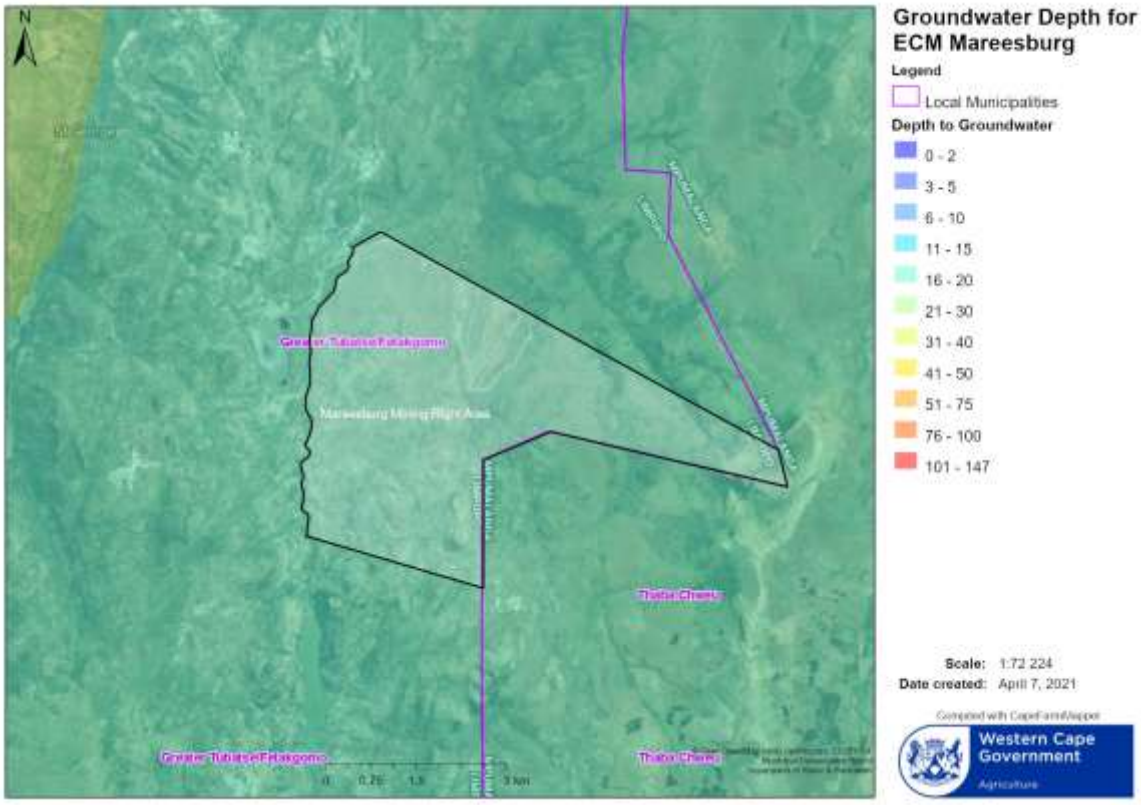


Figure 14: Depth of Groundwater mbgl (Cape Farm Mapper, 2020)

Aquifers in the area are classified as Major Aquafers with Electrical Conductivity (EC) values generally within the acceptable limit for drinking water (Class I, 70 to 150 mS/m) as indicated in **Figure 15** below.

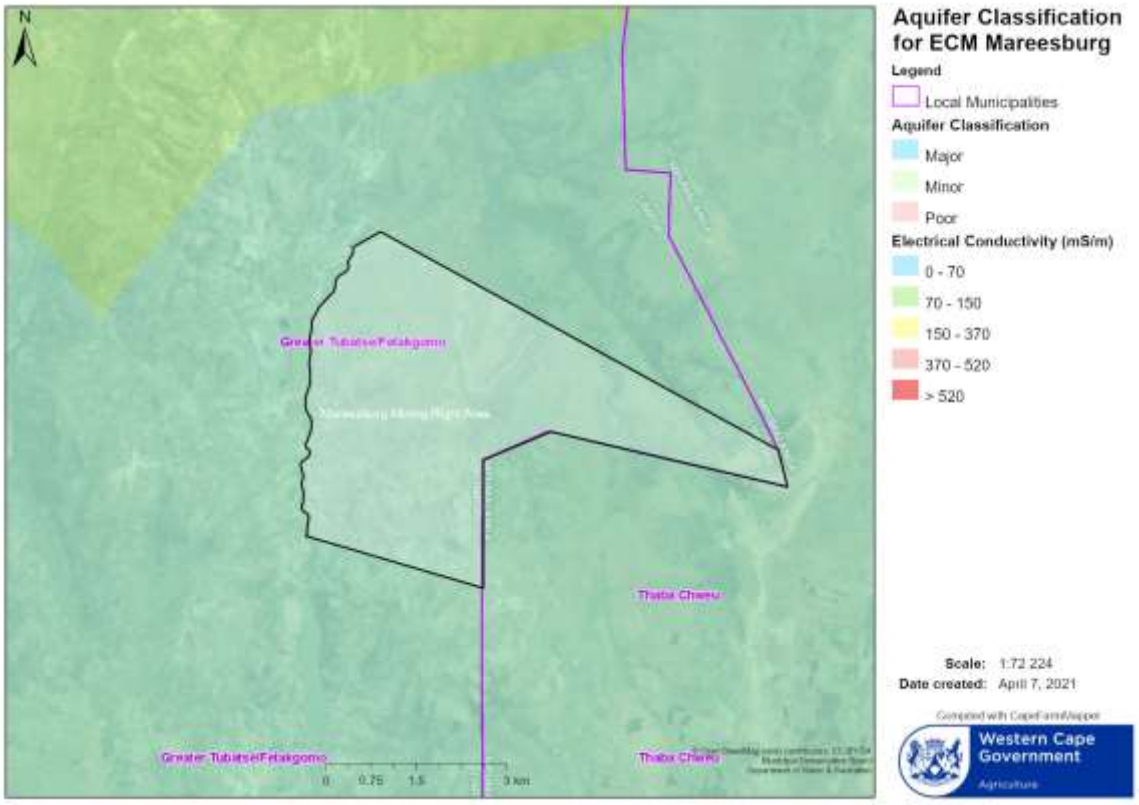


Figure 15: Aquifer type EC Conductivity (Cape Farm Mapper, 2021)

10.2.8 Surface Water

The Mareesburg Chromite mine is located within the B41G Quaternary, which forms part of the Olifants Water Management Area. According to ecological importance this area forms part of the Eastern Bankenveld. The Eastern Bankenveld Ecoregion (Ecoregion 9) is characterised by closed hills and mountains with moderate and high relief together with North-eastern Mountain Grassland and Mixed Bushveld are definitive of the region. Distinctive escarpments occur along the eastern boundary in particular. Large rivers that traverse the area are the Olifants, Elands, Dwars and Steelpoort with perennial tributaries in the region contributing to their flow. The Crocodile River (East) has many of its sources in this area.

The Dwars River (and associated tributaries) is historically known to be affected by various surrounding historic mining activities – including discharge of extraneous groundwater from various chrome and platinum mines and effluent discharge from upstream communities.

The mean annual runoff (MAR) of the site was estimated at 0 – 25 mm annually on the western side to between 21 – 100 mm on the eastern side (**Figure 17** below). The mean annual evaporation (MAE) varies between 1 400 – 1 500 on the west of the site to between 1 100 – 1 200 on the east (**Figure 16** below).

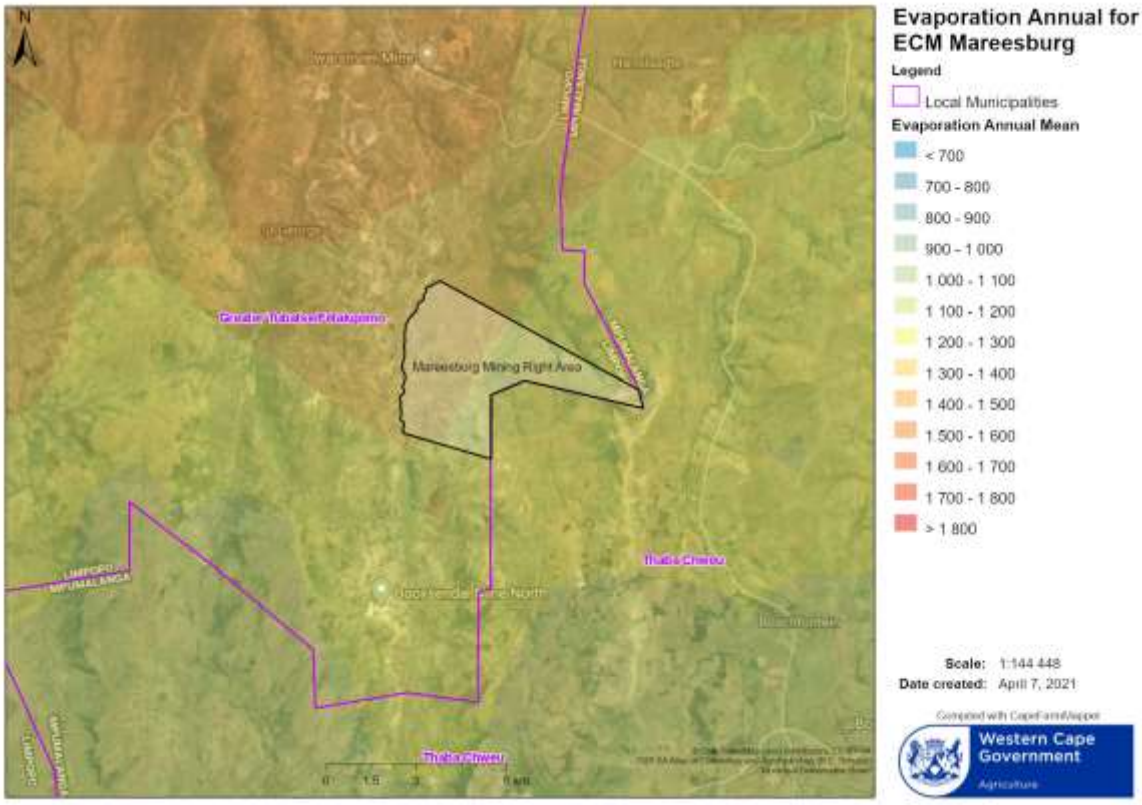


Figure 16: Mean Annual Evaporation (Cape Farm Mapper, 2021)

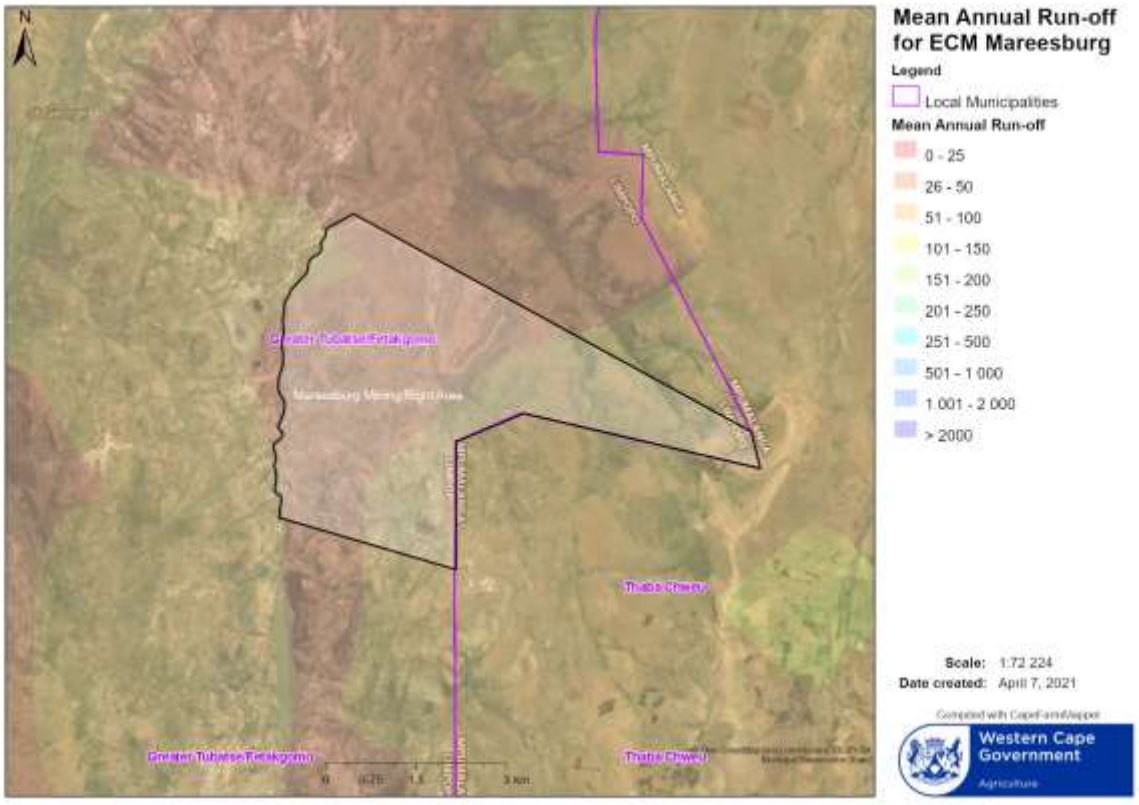


Figure 17: Mean Annual Run-off (Cape Farm Mapper, 2021)

10.2.9 Wetlands

A preliminary assessment indicates no wetlands within the mining authorisation area.

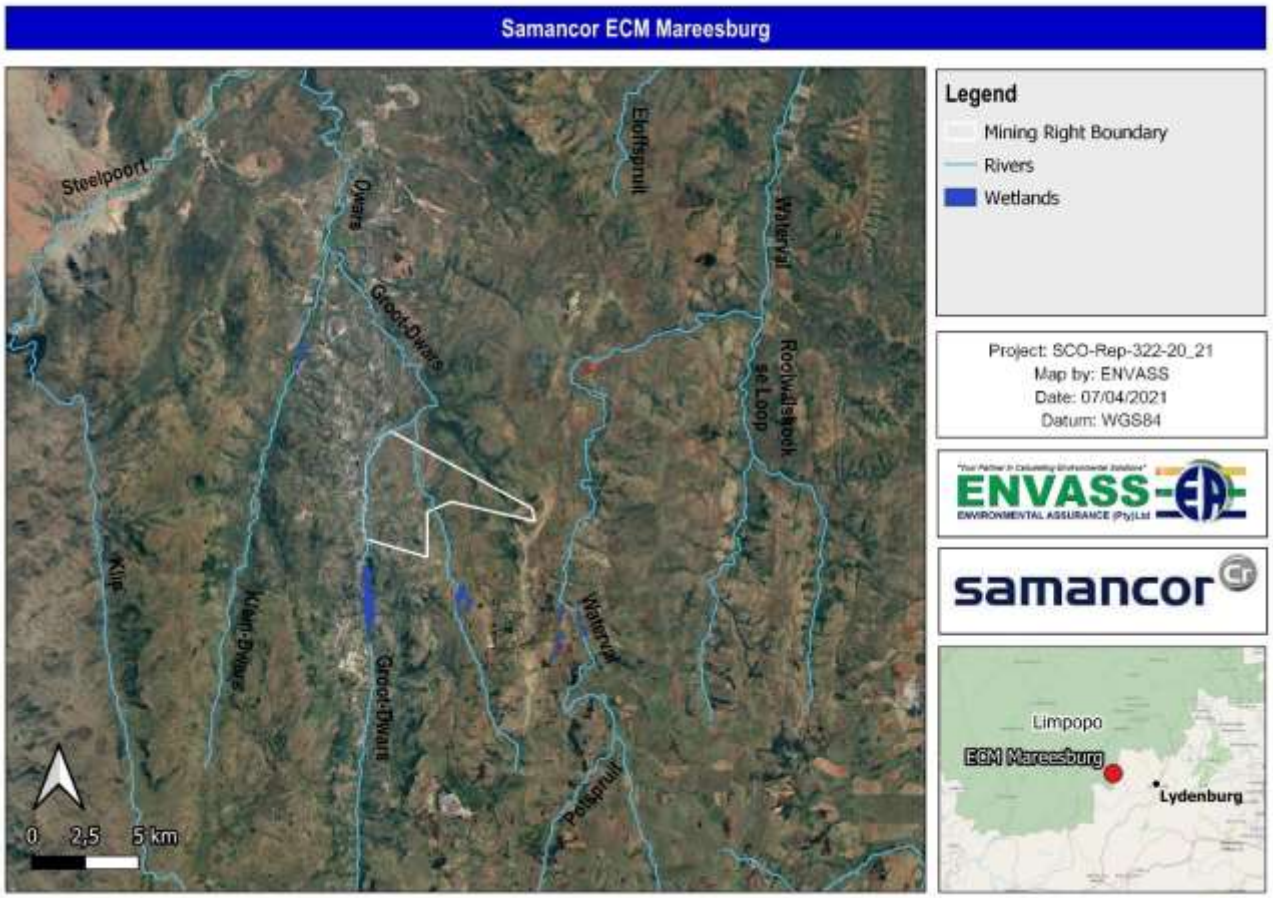


Figure 18: Surface Water (ENVASS, 2021)

10.2.10 Socio-Economic Environment

Reference is made to the Sekhukhune District Development Plan of 2020-2021 and the Draft IDP & Budget 2020/21 for the Fetakgomo Tubatse Local Municipality adopted 26/03/2020.

The Fetakgomo Tubatse Local Municipality (FTLM) is located north of N4 highway, Middleburg, Belfast and Mbombela; and east of the N1 highway; Groblersdal and Polokwane. The municipality is largely dominated by rural landscape with only 06 (six) proclaimed townships. The FTLM is situated on fertile soils alongside the Lepelle, Leppellane and Spekboom Rivers, offering great agricultural potential. Furthermore, the Municipality is surrounded by beautiful mountains, and boasts a rich cultural history. It generally features a dispersed settlement structure, with a number of secondary / gravel roads serving these. Atok and Apel represent the most prominent settlement areas in the western extents of the municipality and Driekop, Burgersfort, Steelpoort and Orichstad in the eastern parts. Due to the concentration of mining activities along the R37 and R555 (Dilokong Corridor), the Municipality functions as a strong economic centre within the Sekhukhune District Municipality

(SDM). As such, mining is not only the major source of employment and economic growth within the municipality, but also the District.

Minerals found within the Municipality include platinum, chrome, vanadium, andalusite, silica and magnetite. The current and planned mining activities within the FTLM is placing extreme pressure on the environment and is resulting in land use conflicts with other uses such as agriculture. Retail, trade, services, and agriculture also contribute to the municipal economy. Agricultural products cultivated in this area include citrus, vegetables, corn, and maize. Livestock farming includes cattle, goats and game. The Municipality generally features a dispersed settlement structure, with a greater concentration of settlements within the western extents. Although featuring a number of major roads (R37, R36 and R555), the LM's numerous settlements are only accessible via secondary gravel roads.

There are 74 traditional leaderships within the SDM. These are mostly concentrated in Fetakgomo Tubatse, Makhuduthamaga, the Eastern extents of Ephraim Mogale and the South-Western extents of Elias Motsoaledi municipality (the former Moutse area in KwaNdebele). With this number of traditional leaderships it is required that healthy relationships relating to land development be established between government and traditional authorities. The implementation of SPLUMA particularly in the rural parts of the district should be well articulated to the traditional leaders and communities in order to have a common understanding of the development. In Fetakgomo Tubatse it covers about 329 850 ha of land which represents 58% of the municipal area.

Population and Households

According to the 2011 Stats SA information; the total population of the Fetakgomo Tubatse Local Municipality (FTLM) is approximately 429 471 with 106 050 households, making the FTLM the municipality with the highest population in the District. The 2016 community survey as compared to the 2011 Stats SA results indicate that the FTLM records a population increase of 489 902 (12%) with household increases amounting to 125 454. As per the current community survey the FTLM households increased with 19 404 (15%).

Table 25 provides an indication of the population and household totals within the Sekhukhune District Municipality and the Fetakgomo Tubatse Local Municipality as of 2018.

Table 25: Population (2018) and annual growth

2018	Population	Average Annual Growth
Sekhukhune District Municipality	1 196 342	1.93 %
Fetakgomo Tubatse Local Municipality	498 000	1.36 %

The increase in the population and annual growth rate is attributed to the increasing number of the mining developments (particularly in FTLM) which serve as an attraction of people for job opportunities, especially the mail population. This increase in the population means that more services will be planned by the municipalities for the expanded settlements and households.

The below table by Statistics South Africa (Census 2011, and Community Survey 2016), found that in 2011 Fetakgomo and Greater Tubatse Municipalities as combined 106 050 households, and current community survey 2016 is at 125 361 within FTLM. The figures as compared to the previous studies (19404) represents 85 per cent increase households. The challenges recorded as incomplete housing units dating back to early 2010s, high housing demand and no well researched priority list.

Table 26: Population and Households

	2011		CS 2016	
	Total Households	**Size of households**	**Total Households**	**Size of households**
Fetakgomo Tubatse	106 050	8.1	125 454	8

Age and Gender

Table 27 below indicate amble evidence demonstrating that the FTLM population has increased. 2011 Census demographic research observes that median age for the municipality population is around 15-19 years for both female and male at 60 670. The other population group of 24-25 for both female and male recorded as 58 989 this means that they represent the entire population of the municipality. **Table 28** represents results of the 2016 community survey indicate the sex ratio of the district. Consequently, FTLM at 97.9 % reveals that there are more males found within the local municipality.

Table 27: Total population by age and gender distribution

Age – 5-year age groups by Sex for Person Weight, FTLM			
	Male	**Female**	**Total**
00-04	26816	27240	54056
05-09	24714	24739	49452
10-14	22774	21192	43966
15-19	32003	28667	60670
20-24	30329	27152	57481
25-29	30051	28938	58989
30-34	22098	23907	46006
35-39	11514	13768	25282
40-44	10130	10409	20539
45-49	7050	9176	16226
50-54	6165	8840	15004
55-59	4890	6247	11137
60-64	4507	5539	10046
65-69	2015	4682	6697
70-74	1460	4823	6282
75-79	845	2650	3495
80-84	401	1732	2134

Age – 5-year age groups by Sex for Person Weight, FTLM			
	Male	**Female**	**Total**
85+	417	2023	2440
Total	**238179**	**251723**	**489902**

Table 28: Population by Gender for the District and Local Municipality

2011 STATS SA				2016 COMMUNITY SURVEY			
Municipalities	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**	**Growth Rate**
SDM	497 648	579 191	1 076 840	548 463	621 299	1 169 762	0.019
Fetakgomo	42 258	51 536	43 732	43 732	52 936	96 668	0.007
Tubatse	160 398	175 278	335 676	194 726	198 987	393 713	0.036

Education Profile

Education is one of the basic human rights in South Africa and among the important socioeconomic indicators for development. In this section, the levels of educations and number of schools will be profiled using the data from Community Survey 2016 and IHS Market. The education measure below represents the highest level of education of an individual, using the 15 years and older age category. According to the United Nations definition of education, one is an adult when 15 years or older.

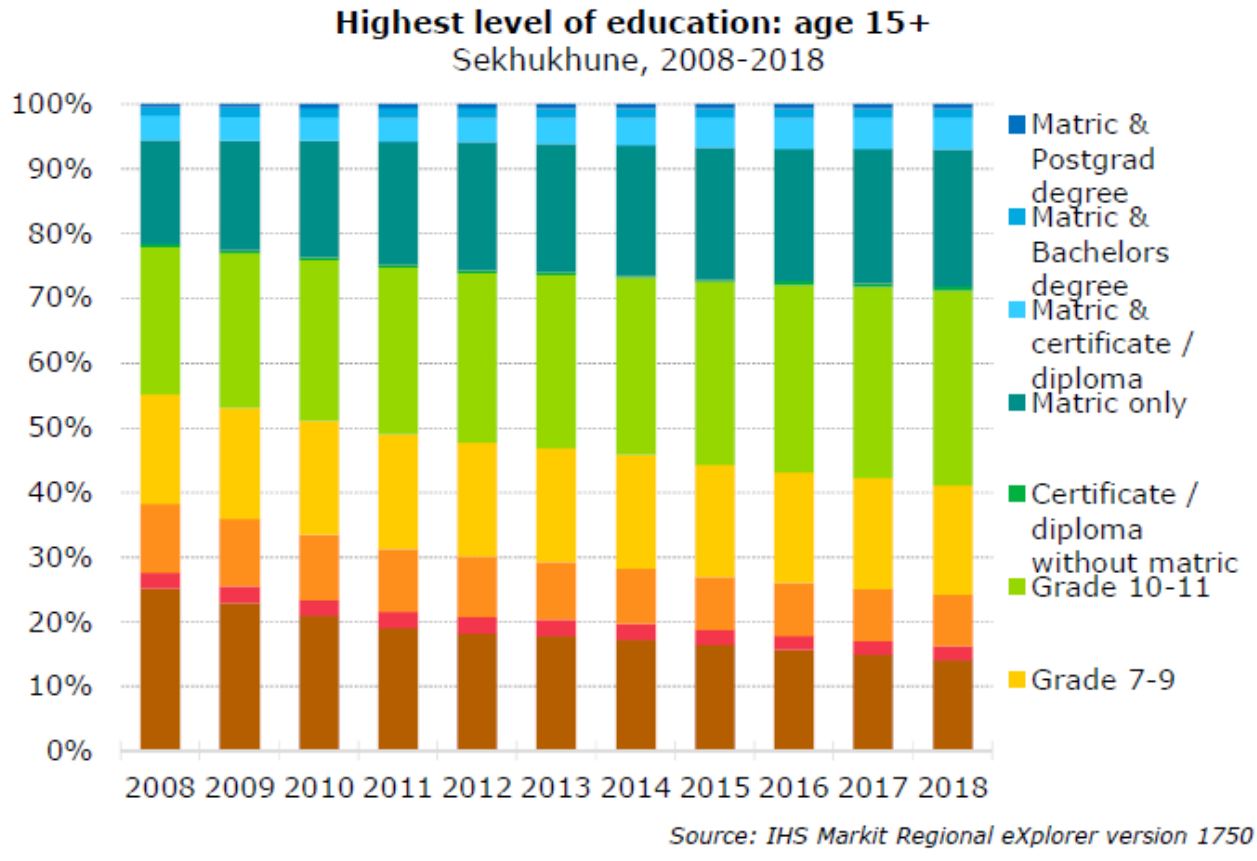


Figure 19: Highest Level of Education

Figure 19 above shows that the number of people without any schooling in Sekhukhune District decreased from 2008 to 2018 with an average annual rate of -3.42%, while the number of people within the 'matric only' category, increased from 84,700 to 140,000 in the past 10 years. The number of people with 'matric and a certificate/diploma' increased with an average annual rate of 5.25%, with the number of people with a 'matric and a Bachelor's' degree increasing with an average annual rate of 2.61%. The above figure shows an improvement in the level of education with an increase in the number of people with 'matric' or higher education.

However, the education levels in the district are lower than the comparative levels for Limpopo province. The literacy rate is one of the main development indicators of the economic status as the increased literacy rate results enhancement of country's human capital development. According to the Limpopo Provincial Growth and Development Strategy, Sekhukhune District has the least of highly skilled persons in the province.

There are approximately 187 161 people 20 years or older in the district who have no schooling. Only 4 % of the population have higher education. This will likely constrain the ability of the District to improve its socio-economic conditions significantly in the short to medium term. Given the development framework of the district to industrialize, the district is likely to decline on the requisite skills to support its industrialization and growth path (National Treasury, 2019).

When it comes to schools in the district, there is a total of 924 schools in the district. The table below shows the number in the FTLM. The FTLM has the highest number of schools in the district.

Table 29: Number of schools (Department of Education, Limpopo)

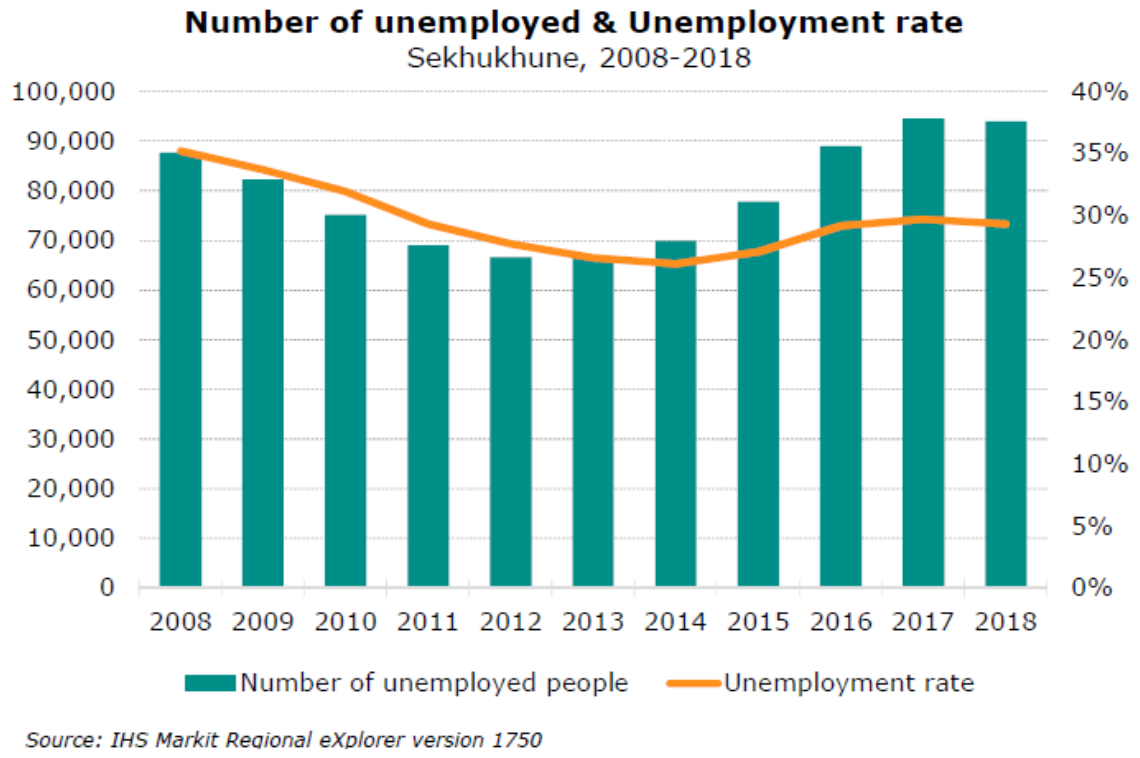
2018	FTLM
Number of Primary Schools	106
Number of Secondary Schools	129
Number of Combined Schools	9
Number of Special Schools	1
TVET Colleges	2
Number of Private Schools	11
Total	**377**

Unemployment

Figure 20 below shows that there has been a rise in unemployment between 2008 and 2018. In 2018, there were a total number of 93 900 people unemployed in Sekhukhune, which is an increase of 6 360 from 87 600 in 2008. The total number of unemployed people within Sekhukhune constitutes 28.17% of the total number of unemployed people in Limpopo Province.

The Sekhukhune District Municipality experienced an average annual increase of 0.70% in the number of unemployed people, which is worse than that of the Limpopo Province which had an average annual decrease in unemployment of -1.20%.

In 2018, the unemployment rate in Sekhukhune District Municipality (based on the official definition of unemployment) was 29.31%, which is a decrease of -5.87 percentage points. The unemployment rate in Sekhukhune District Municipality is higher than that of Limpopo. The unemployment rate for South Africa was 27.22% in 2018, which is an increase of -3.62 percentage points from 23.60% in 2008. The graph below shows the shows a clear picture of the number of unemployed versus the unemployment rate in the district, between 2008 and 2018. **Figure 21** indicates the unemployment rate of local municipalities within the SDM.



Source: IHS Markit Regional eXplorer version 1750

Figure 20: Unemployment and unemployment rate (official definition) – Sekhukhune District Municipality, 2008 - 2018

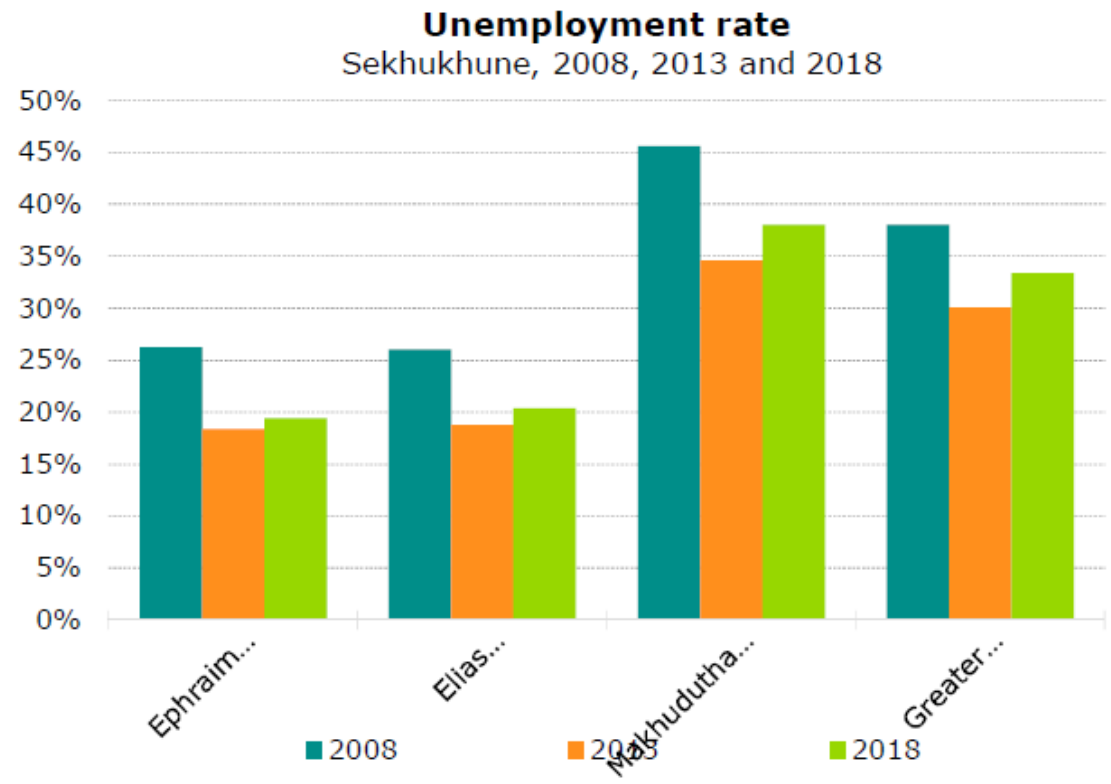


Figure 21: Unemployment Rate – Local Municipalities and the rest of Sekhukhune District Municipality, 2008, 2013 and 2018

Poverty

In 2018, there were 886 000 people living in poverty, using the upper poverty line definition, across Sekhukhune District Municipality - this is 3.55% higher than the 855 000 in 2008. The percentage of people living in poverty has decreased from 81.83% in 2008 to 74.12% in 2018, which indicates a decrease of 7.71 percentage points. **Table 30** and **Figure 22** below, shows the percentage of people living in poverty by population group.

Table 30: Percentage of people living in poverty by population group (Sekhukhune, 2008 – 2018)

Year	African	White	Coloured	Asian
2008	82.6 %	2.6 %	51.3 %	15.5 %
2009	80.7 %	2.9 %	50.2 %	13.0 %
2010	76.2 %	2.1 %	47.4 %	9.8 %
2011	71.4 %	1.3 %	43.2 %	6.9 %
2012	71.0 %	1.3 %	45.0 %	7.2 %
2013	71.7 %	1.3 %	47.5 %	7.7 %
2014	73.0 %	1.4 %	50.5 %	8.1 %
2015	72.8 %	1.9 %	52.4 %	8.4 %
2016	74.5 %	2.8 %	55.7 %	10.8 %
2017	75.2 %	3.6 %	57.1 %	13.5 %
2018	74.9 %	3.8 %	57.7 %	15.9 %

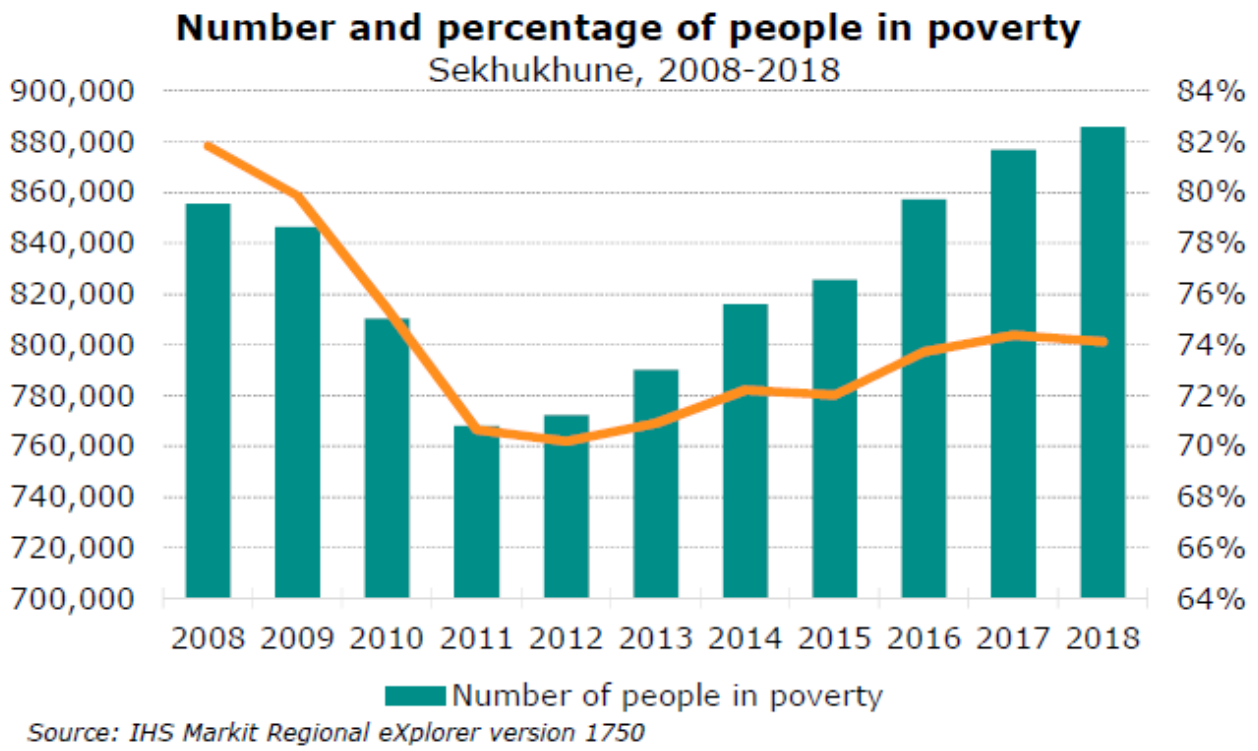


Figure 22: Number and percentage of people living in poverty (Sekhukhune District Municipality, 2008 – 2018)

In 2018, the population group with the highest percentage of people living in poverty was the African population group with a total of 82.6% people living in poverty, using the upper poverty line definition. The proportion of the African population group, living in poverty, decreased by 7.66 percentage points, as can be seen by the change from 82.60% in 2008 to 74.93% in 2018. In 2018 15.93% of the Asian population group lived in poverty, as compared to the 15.47% in 2008. The White and the Coloured population group saw a decrease in the percentage of people living in poverty, with a decrease of -1.25 and -6.41 percentage points respectively. The graph below shows figures of people living in poverty per each local municipality in the SDM. The lowest percentage of people living in poverty can be observed in the FTLM with a total of 70.4% living in poverty, using the upper poverty line definition.

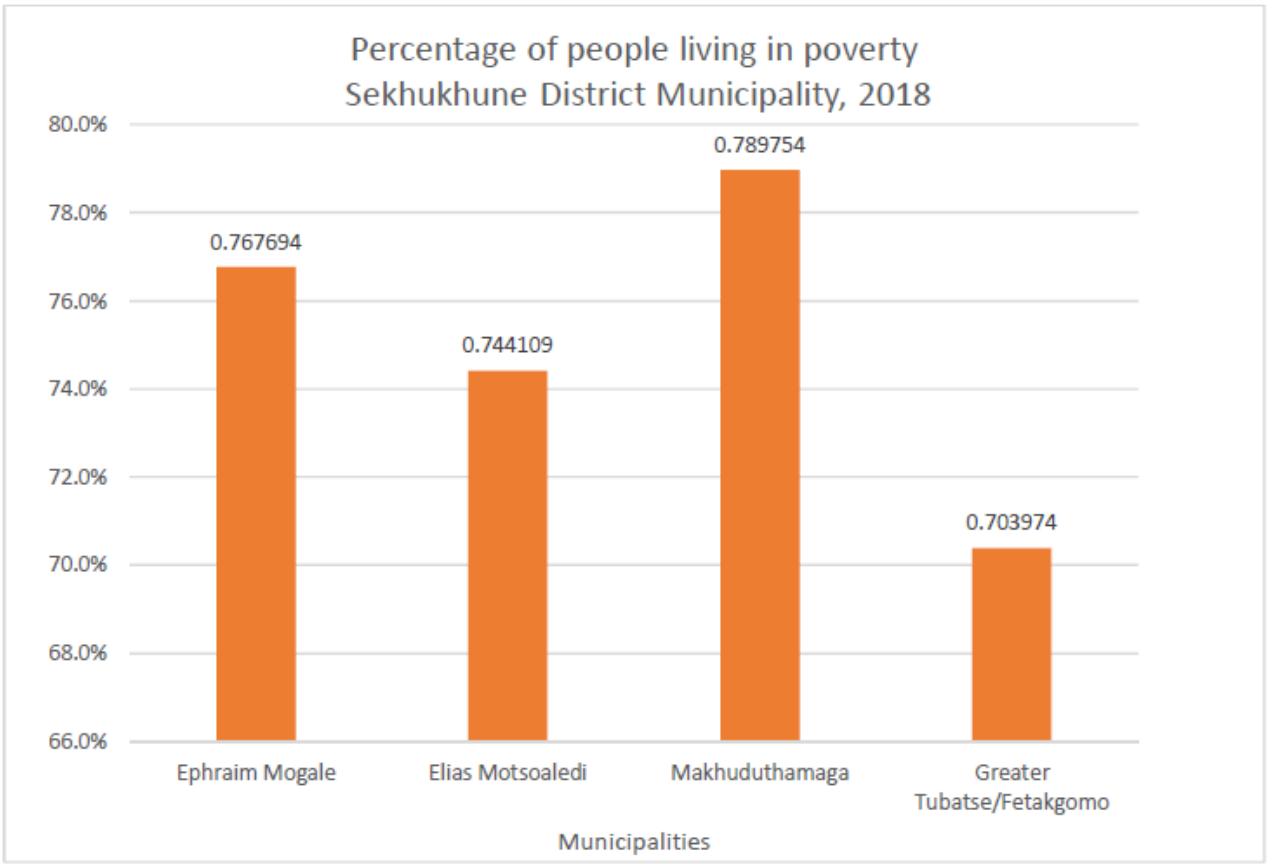


Figure 23: Percentage of people living in poverty – local municipalities and the rest of Sekhukhune District Municipality, 2018

Gross Domestic Product

The Gross Domestic Product (GDP), an important indicator of economic performance, is used to compare economies and economic states. Gross Domestic Product by Region (GDP-R) represents the value of all goods and services produced within a region, over a period of one year, plus taxes and minus subsidies.

With a GDP of R 41 billion in 2017 (up from R 16.5 billion in 2007), the Sekhukhune District Municipality contributed 12.22% to the Limpopo Province GDP of R 336 billion in 2017 increasing in the share of the Limpopo from 11.75% in 2007. The Sekhukhune District Municipality contributes 0.88% to the GDP of South Africa which had a total GDP of R 4.65 trillion in 2017 (as measured in nominal or current prices). It's contribution to the national economy stayed similar in importance from 2007 when it contributed 0.78% to South Africa, but it is lower than the peak of 0.94% in 2011.

Table 31: Gross Domestic Product (GDP) – Sekhukhune, Limpopo and National Total, 2007 – 2017 [R Billions, Current Prices]

	Sekhukhune	Limpopo	National Total	Sekhukhune as % of province	Sekhukhune as % of national
2007	16.5	140.4	2 109.5	11.7 %	0.78 %
2008	19.7	162.9	2 369.1	12.1 %	0.83 %
2009	22.4	181.9	2 507.7	12.3 %	0.89 %

	Sekhukhune	Limpopo	National Total	Sekhukhune as % of province	Sekhukhune as % of national
2010	25.4	202.2	2 748.0	12.6 %	0.92 %
2011	28.4	222.3	3 023.7	12.8 %	0.94 %
2012	30.3	238.5	3 253.9	12.7 %	0.93 %
2013	32.6	258.2	3 540.0	12.6 %	0.92 %
2014	34.0	273.2	3 805.3	12.4 %	0.89 %
2015	35.2	289.3	4 051.4	12.2 %	0.87 %
2016	37.9	311.7	4 350.3	12.2 %	0.87 %
2017	41.0	335.7	4 651.8	12.2 %	0.88 %

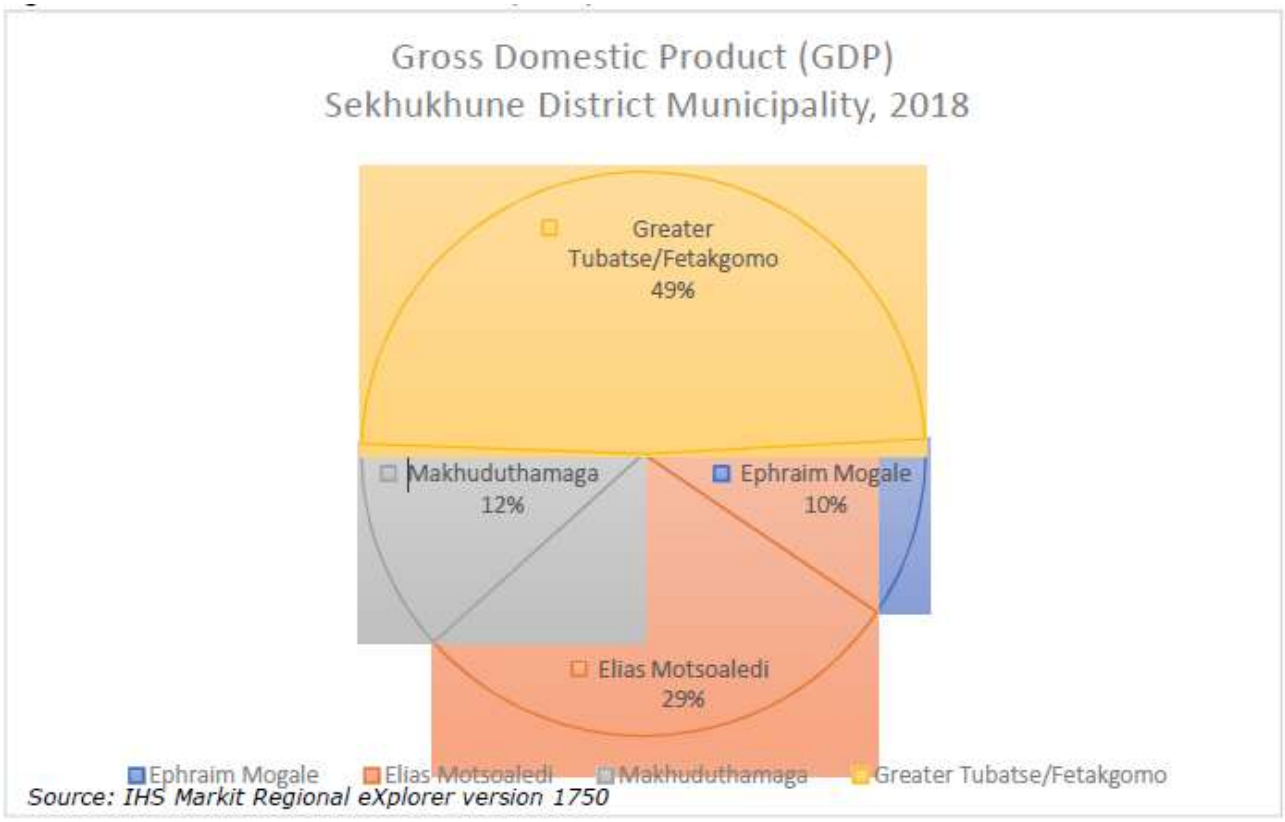


Figure 24: Gross Domestic Product (GDP) per local municipality contribution

In terms of Local Municipality contributions, the greatest contributor is the FTLM with a share of 48.58% or R 21.2 billion, increasing from R 10.3 billion in 2008. This is due to the mining sector which is concentrated in the Municipal area.

Gross Value Added (GVA)

The Sekhukhune District Municipality's economy is made up of various industries. Gross Value Added (GVA) is a measure of output (total production) of a region in terms of the value that was created within that region. GVA can be broken down into various production sectors.

The summary table below puts the Gross Value Added (GVA) of all the regions in perspective to that of the Sekhukhune District Municipality to other municipal areas in the district due to the mineral resources that are available and the current mining activities that are taking place.

Table 32: Gross Value Added (GVA) by Broad Economic Sector – Sekhukhune District Municipality, 2017 [R Billions, Current Prices]

	Sekhukhune	Limpopo	National Total	Sekhukhune as % of province	Sekhukhune as % of national
Agriculture	0.6	7.9	106.4	7.9 %	0.58 %
Mining	16.2	85.7	334.7	18.9 %	4.85 %
Manufacturing	1.0	8.6	551.6	11.6 %	0.18 %
Electricity	1.0	12.8	155.2	7.5 %	0.62 %
Construction	0.7	9.7	163.3	7.4 %	0.44 %
Trade	4.5	45.1	626.8	10.0 %	0.72 %
Transport	1.2	14.7	411.5	8.2 %	0.29 %
Finance	5.1	44.9	840.7	11.3 %	0.60 %
Community Services	6.7	71.5	981.6	9.4 %	0.69 %
Total Industries	**37.1**	**300.7**	**4 171.7**	**12.3 %**	**0.89 %**

In 2017, the mining sector is the largest within Sekhukhune District Municipality accounting for R 16.2 billion or 43.8% of the total GVA in the district municipality's economy. The sector that contributes the second most to the GVA of the Sekhukhune District Municipality is the community services sector at18.2%, followed by the finance sector with 13.7%. The sector that contributes the least to the economy of Sekhukhune District Municipality is the agriculture sector with a contribution of R 620 million or 1.67% of the total GVA.

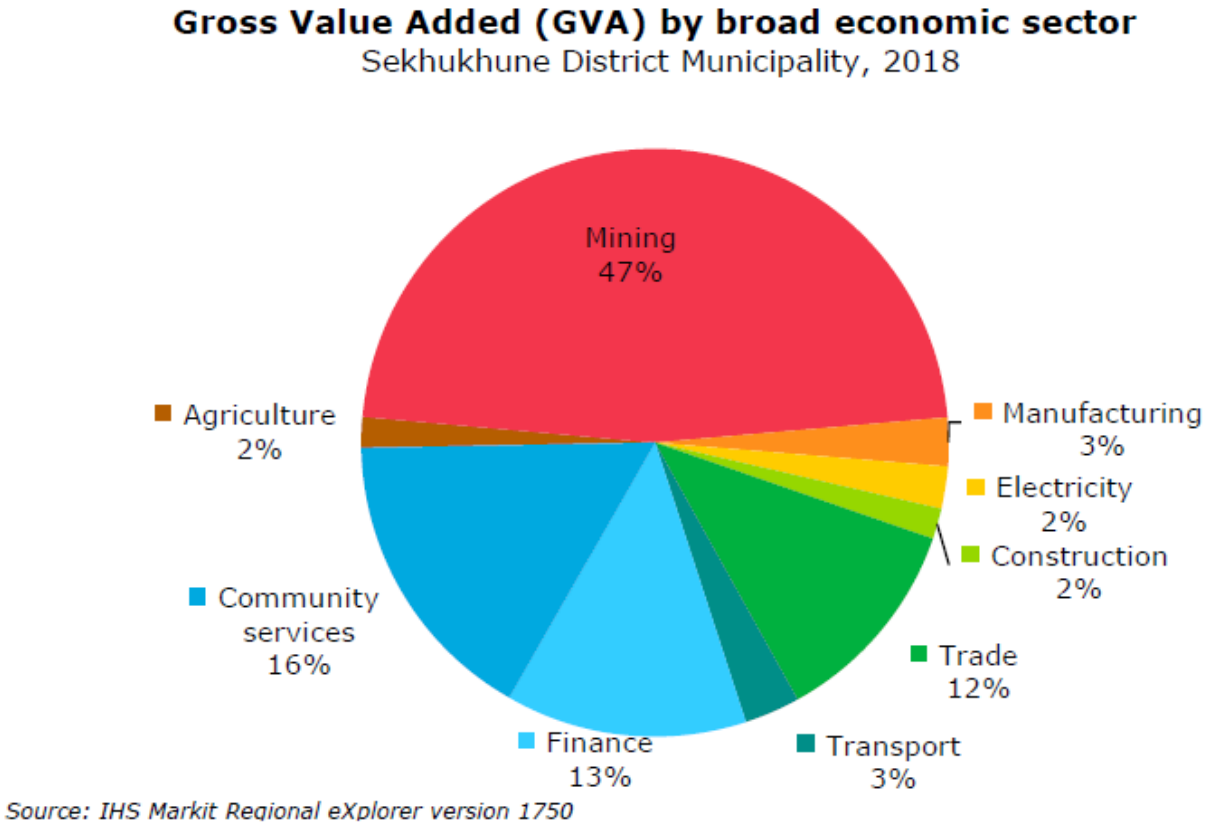


Figure 25: Gross Value Add by Broad Economic Sector

According to IHS Markit, in 2018, the mining sector remained the largest sector within Sekhukhune District accounting for R 18.6 billion or 47.2% of the total GVA in the district municipality's economy. Community Services is the second most contributor at 16.4%, followed by the finance sector with 13.3%. The sector that contributes the least to the economy of Sekhukhune District Municipality is the construction sector with a contribution of R 660 million or 1.68% of the total GVA. This requires that capacity relating to the skills needed by the mining industry be developed within the District. This further necessitates that relevant curriculum be also discussed with the existing TVET Colleges within the district as the mining academy will be planned.

Table 33: Gross Value Added (GVA) by broad economic sector – Sekhukhune District Municipality, 2008, 2013 and 2018 [R Billions, 2010 Constant Prices]

	2008	2013	2018	Average Annual Growth
Mining	11.20	12.15	12.40	1.03 %

Sector Growth Forecast

The mining sector is expected to grow fastest at an average of 5.25% annually from R 11.8 billion in Sekhukhune District Municipality to R 15.2 billion in 2022. The mining sector is estimated to be the largest sector within the Sekhukhune District Municipality in 2022, with a total share of 49.8% of the total GVA (as measured in current prices), growing at an average annual rate of 5.2%.

Table 34: Gross Value Added (GVA) by broad economic sector – Sekhukhune District Municipality, 2017 – 2022 [R Billions, Constant 2010 Prices]

Sector	2017	2018	2019	2020	2021	2022	Average Annual Growth
Mining	11.80	12.21	12.92	13.49	14.34	15.24	5.25 %

Mining

SDM mining cuts across the north-eastern part of the Bushveld Complex, an immense geological structure that contains the largest reserves of platinum group metals (PGM) in the world, of which the platinum group is a family of 6 metals which entail platinum, palladium, rhodium, iridium, osmium, and ruthenium. In SDM the mining sector is dominant in the Burgersfort area were FTLM seats. Mining is the economic lifeblood of the area as the sector accounts for 34.5% of the municipality's total GVA and 55% of the municipality's total labour force are traced to the mining sector. The mining value chain consists primarily of exploration, extraction, mining, processing, refining, fabrication and production stages. Sekhukhune District mining participates mostly in the extraction stage and very limited processing operations. Minerals and potential jobs are exported for beneficiation to overseas companies and very little beneficiation in the district and in South Africa as a whole. In order to benefit sustainably on its mineral resources, the district will need to develop its industrial capabilities in the value-creation stages of its core mineral endowments.

For other minerals such as limestone and dolomite, they include construction (mortar, whitewash, building stone) and manufacturing (glass, water treatment, food and rayon processing, papermaking, leather, explosives, coal dusting, flue gas desulphurization, adhesives, insulation, and pH control). In the Burgersfort area site, asbestos, chromite, and platinum deposits from the Merensky Reef are mined in the town. Furthermore, the District features the world's largest deposit of the platinum group metals (PGMs). Figure 26 provides an illustration of the mining value chain and the spatial distribution of mining activities in SDM.

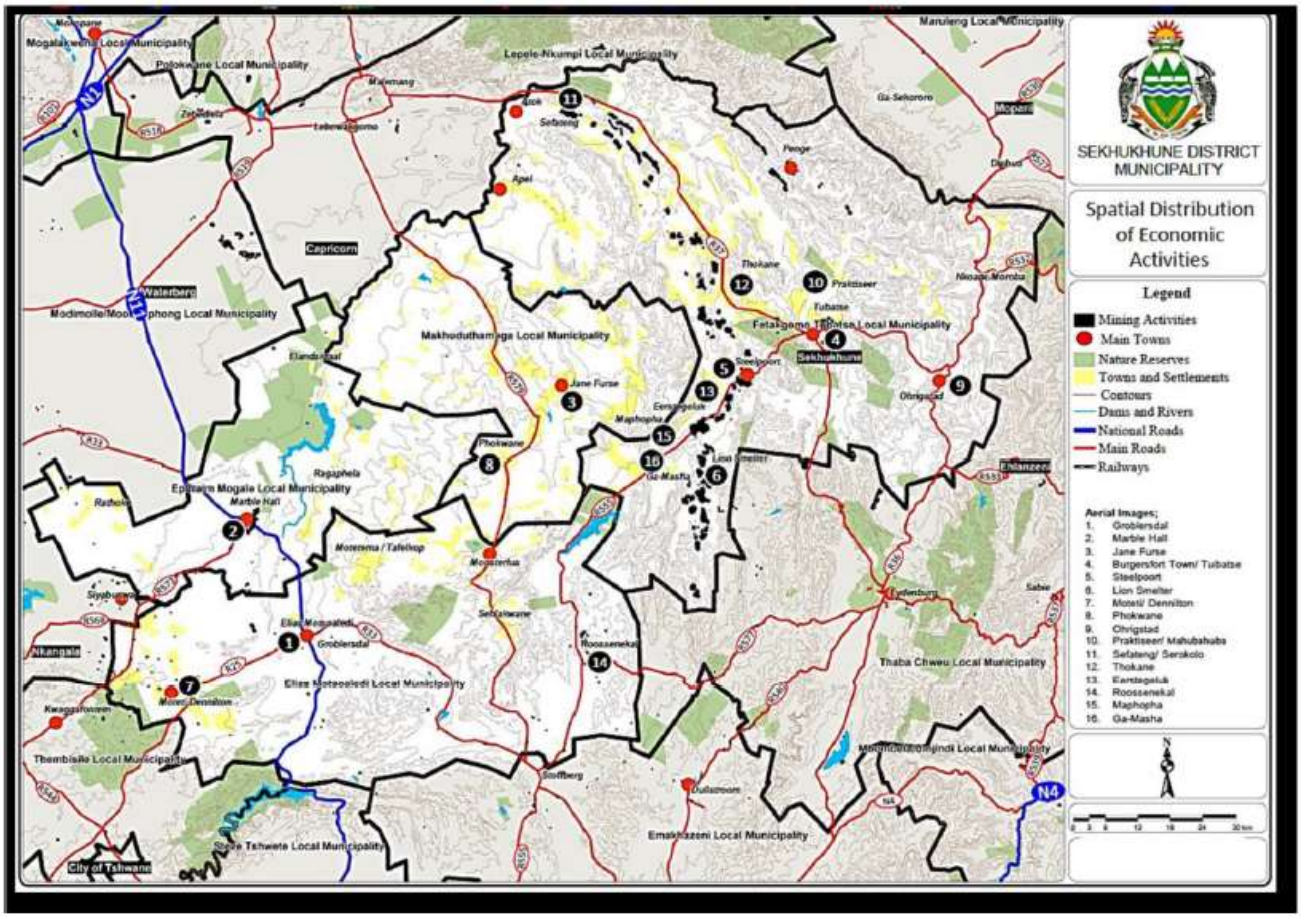


Figure 26: Spatial Distribution of Mining Activities in SDM (Source: SDM Development Framework, 2018)

Opportunities exist for the small businesses within the district. It is vital that they be supported by being linked to the mining value chain for business development. Mining houses and the local hotel industry require catering services (which again links with agricultural development because local farms could supply fresh vegetables and meat), cleaning services, and repairing of machinery. Manufactured inputs could also be supplied to the mines and the industry at large, thereby growing the district's manufacturing capability. Strengthening initiatives like Enterprise and Supplier Development will build economic and business capacity of the SMMEs within the district.

Although mining is such a large economic contributor within the district, its future needs to be considered as this has significant implications on future settlement planning and investments. Building strong manufacturing base within the district is critical for future economic sustainability.

Health

A better health is central to the well-being of the people within the district. It also makes an important contribution to economic development as healthy people live longer and are more productive. There are various diseases that affect the wellbeing of the communities within the district, and these include HIV/AIDS, diabetes, Hypertension, Tuberculosis, etc.

Tourism

Generally, owing to its disposition, the tourism sector is positively linked to other sectors of the economy like agriculture, transport, finance, and trade. The following are potential tourism opportunities within the Fetakgomo Tubatse Municipality:

Tjate Heriatge Site, Potlake Game Reserve, Lenao La Modimo, Platinum Belt, Strydom Tunnels, and other leisure establishments. Linkage with Mpumalanga creates potential for tourism by-passes hence a need for alternative route to easy traffic on R37 and R555.

10.2.11 Description of the Current Land Uses

The current land uses in the area are represented in **Figure 27** below. The land uses consist of undisturbed thicket, woodland, grassland and low shrubland. Disturbed areas consist of mining, cultivation, urban villages, and related activities.

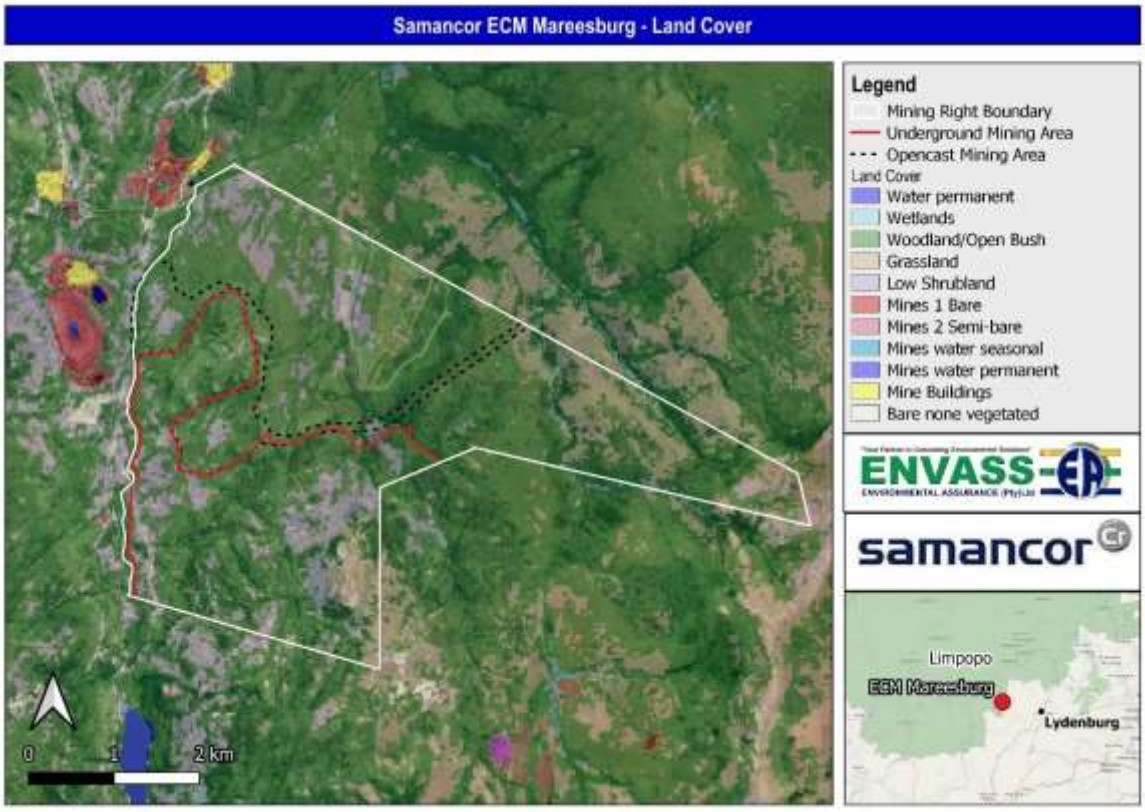


Figure 27: ECM Mareesburg Current Land Use Map

10.3 DESCRIPTION OF SPECIFIC ENVIRONMENTAL FEATURES AND INFRASTRUCTURE ON THE SITE

10.3.1 Environmental Features

During the EIA Phase of the project, specialist studies will be conducted to identify specific environmental features and infrastructure present on site. According to the EIA Screening Tool, areas with high land capability sensitivity features were identified in the area.

High sensitivity animal features include the presence of *Mammalia-Rhinolophus cohenae* with no plant sensitivities higher than medium identified. Terrestrial Biodiversity was assessed to have a very high sensitivity as it falls within Critical Biodiversity Area (CBA) 1, Freshwater ecosystem priority area quinary catchments, Focus Areas for land-based protected areas expansion and endangered ecosystem.

The aquatic sensitivity is also assessed to have a very high sensitivity rating as the proposed Mareesburg Chrome mine is located within aquatic CBA's and the freshwater ecosystem priority area quinary catchments.

High sensitivity archaeological and heritage features include the location of the proposed site within 500 m of an important river (the Groot-Dwarsriver). No Palaeontological features of significance were identified.

The Civil Aviation sensitivity is assessed to be of high sensitivity on the eastern part of the proposed site as the area is overlain by dangerous and restricted airspace as demarcated.

10.3.2 Environmental and current land use map

(Show all environmental, and current land use features)

Refer to Appendix 5.

10.3.3 Infrastructure Features

Road infrastructure is well established and there is little need for infrastructure upgrades. All final products will be trucked from site, as there is no railway line situated on the proposed mining area. Eskom power is available in the proximity of the mining site. Water will be sourced from the Anglo-American De Brochen pipeline.

11 IMPACTS IDENTIFIED

List of the potential impacts identified of the activities described in the initial site layout that will be undertaken, as informed by both the typical known impacts of such activities, and as informed by the consultations with affected parties together with the significance, probability and duration of the impacts.

This Environmental Scoping Study (ESS) aims to identify the potential positive and negative impacts (both biophysical and social) associated with the Proposed Project. The potential impacts have been identified through baseline investigations and below are a summary per phase.

Potential impacts that may be caused by the proposed development will be identified using input from the following:

- Consultation with I&APs;
- Existing information;
- Specialist investigations;
- Site visit with the project team; and
- Legislation.

The following potential direct, indirect, and cumulative impacts were identified at this stage:

- Potential Contamination and compaction of soils;
- Erosion potential increase;
- Altered landforms;
- Loss of agricultural potential and land capability;
- Contamination of ground water quality and increase in quantity;
- Loss of biodiversity;
- Loss and displacement of fauna;
- Destruction or loss of heritage features including graves and other historical sites of importance that may be uncovered during excavations;
- Decreased aesthetic value and impact on “Sense of Place”;
- Poor air quality and decreased visibility due to dust pollution;
- Increased noise levels;
- Increase Waste generation;
- Slight increase in traffic and need for maintenance of road infrastructure;
- Altered Socio-Economic Environment (Positive or negative).

Table 35, **Table 36** and **Table 37** categorizes the anticipated impacts for the construction, operational and closure phases respectively. **Table 38** summarises impacts expected during all phases of the proposed activities with **Table 39** indicating cumulative impacts. **Table 40** provides the impacts of the no-go alternative.

Table 35: Impacts during the Construction Phase

ACTIVITY	ENVIRONMENTAL ASPECT	DESCRIPTION OF IMPACT	SIGNIFICANCE PRE-MITIGATION	PROBABILITY	DURATION
IMPACTS DURING THE CONSTRUCTION PHASE					
GENERAL IMPACTS					
Clearing of vegetation and topsoil and excavation for the access and haul roads, footprint, and opencast areas. Site preparation including the access road involving clearing vegetation, excavation, and backfilling. Boundary fence, footprint preparation. Earthworks to excavate in preparation of mining and infrastructure construction. Stockpiling of topsoil and overburden for rehabilitation purposes. Loading and hauling of topsoil and overburden to stockpiles respectively.	GEOLOGY AND SOILS	Contamination of soils through: - Accidental spillage of chemicals such as hydrocarbon-based fuels and oils or lubricants spilled from construction vehicles and other chemicals from construction activities. - Vehicle and personnel activities as well as storage of materials & equipment, compaction, and degradation impacts.	Low (-)	Probable	Short term
		Disturbance of in-situ geology.	Low (-)	Possible	Short term
		Disturbance of soil.	Low (-)	Possible	Short term
		Reduction of viability of soils in stockpiles.	Medium (-)	Probable	Short to medium term
	TOPOGRAPHY	Alteration of topography.	Medium (-)	Possible	Short term
	LAND CAPABILITY	Increased erosion in other areas.	Low (-)	Possible	Short term
		Reduction in land capability in other areas.	Medium (-)	Probable	Long term
	LAND USE	Loss of access to land.	High (-)	Possible	Long term
		Increased pressure on land.	Medium (-)	Probable	Short term
		Clearance of new land in other areas.	Medium (-)	Possible	Short term
	HYDROLOGICAL AND SURFACE WATER	Surface water quality: - Chemicals such as hydrocarbon-based fuels and oils or lubricants spilled from construction vehicles.	High (-)	Possible	Short term
		Surface water quantity	High (-)	Probable	Long term
		River characteristics (Beds, Banks, Course)	High (-)	Definite	Long term
	GROUNDWATER	Deterioration of groundwater quality as a result of oil, diesel and chemical spills.	Medium (-)	Possible	Long term
		Deterioration of groundwater quality during the construction phase as a result of the contamination of mine material exposed during mine construction.	Medium (-)	Possible	Long term
	BIOLOGICAL FAUNA AND FLORA	Potential decrease in biodiversity on the study and surrounding area.	Low (-)	Highly Probable	Long term
		Occurrence of alien invasive species.	Medium (-)	Probable	Short to medium

ACTIVITY	ENVIRONMENTAL ASPECT	DESCRIPTION OF IMPACT	SIGNIFICANCE PRE-MITIGATION	PROBABILITY	DURATION
IMPACTS DURING THE CONSTRUCTION PHASE					
GENERAL IMPACTS					
Construction of infrastructure required including offices, workshops, ablution facilities, pipelines, power lines, conveyors, processing plant, power lines. Construction of Diesel Storage Tanks. Construction of water management infrastructure (water supply dams, PCD's berms, trenches), haul roads, monitoring boreholes. Construction of access and haul roads. Dust Suppression. Construction of waste rock dumps and tailings storage facilities.					term
		Impact on natural local migratory routes and faunal dispersal patterns.	Medium (-)	Definite	Long term
		Disturbance and loss of fauna through noise, light and dust pollution.	Medium (-)	Definite	Long term
	AQUATIC BIODIVERSITY	Damage of Aquatic Ecosystems.	Low (-)	Possible.	Long term
	VISUAL	Visibility from sensitive receptors / visual scarring of the landscape as a result of the removal of vegetation.	Medium (-)	Definite	Short term
		Added impact of security lighting on surrounding landowners and nocturnal animals.	Medium (-)	Definite	Short term
	NOISE AND VIBRATION	Nuisance and health risks caused by an increase in the ambient noise levels as a result of noise impacts associated with the operation of construction vehicles, EMV's and equipment.	Medium (-)	Definite	Short term
		Vibration due to construction activities.	Low (-)	Definite	Short term
	AIR QUALITY	Windborne dust (soil), vehicle emissions, altering air quality.	Medium (-)	Definite	Short term
	SOCIO ECONOMIC	Construction cost to Samancor.	Medium (-)	Definite	Permanent
		Strengthening of regional and local economy due to income and knock-on opportunities	Medium (+)	Definite	Long term
		Restricted access to land and other destinations (obstruction).	Medium (-)	Possible	Medium term
		Increased pressure on water supply and sanitation as a result of inward migration.	Low (-)	Probable	Short term
		Increase in sexually transmitted disease and HIV/AIDS as a result of inward migration.	Medium (-)	Possible	Long term
		Increase in waterborne diseases, as a result of inward migration and increased pressure on water supply and sanitation.	High (-)	Possible	Long term
		Reduction in nutrition and food security as a result of loss of access to subsistence agricultural land.	Medium (-)	Probable	Short term

ACTIVITY	ENVIRONMENTAL ASPECT	DESCRIPTION OF IMPACT	SIGNIFICANCE PRE-MITIGATION	PROBABILITY	DURATION
IMPACTS DURING THE CONSTRUCTION PHASE					
GENERAL IMPACTS					
		Poorer health care as a result of inward migration and increased pressure on medical resources.	Medium (-)	Possible	Short term
		Increase in road safety risks due to increased road traffic.	Refer to Traffic below.		
		Increase in noise and vibration.	Refer to noise above.		
		Reduction in sense of place.	Refer to Visual above.		
	ARCHAEOLOGY AND PALAEONTOLOGY	Loss of archaeological and palaeontological resources during ground clearance.	High (-)	Probable	Long term
		Disturbance of graves and human remains.	High (-)	Probable	Long term
	TRAFFIC	Increase in vehicle movement to and from the mine.	Low (-)	Definite	Short term
	WASTE	Generation of additional general waste, litter, building rubble and hazardous material during the construction activities.	Medium (-)	Definite	Short term

Table 36: Impacts during the operational phase

ACTIVITY	ENVIRONMENTAL ASPECT	DESCRIPTION OF IMPACT	SIGNIFICANCE PRE-MITIGATION	PROBABILITY	DURATION
IMPACTS DURING THE OPERATIONAL PHASE					
GENERAL IMPACTS					
-Clearing of vegetation and topsoil by bulldozer / frontend loader during opencast mining -Stockpiling of topsoil and overburden for later rehabilitation -Opencast mining using heavy duty earth moving equipment -Blasting -Stockpiling of ROM -Loading, hauling and transport by truck of ROM to stockpiles and processing plant. -Crushing, screening and washing of ROM.	GEOLOGY AND SOILS	Loss of topsoil during stripping, stockpiling, handling and placement on rehabilitated areas.	Medium (-)	Possible	Long term
		Contamination of soils through: - Accidental spillage of chemicals such as hydrocarbon-based fuels and oils or lubricants spilled from construction vehicles and other chemicals from construction activities e.g., paints. - Vehicle and personnel activities as well as storage of materials & equipment, compaction, and degradation impacts.	Medium (-)	Probable	Short term
		Vehicle and personnel, as well as storage of materials, equipment and stockpiling, compaction, and degradation impacts.	Low (-)	Probable	Long term
		Disturbance of in-situ geology.	Medium (-)	Probable	Long term
		Disturbance of soil.	Low (-)	Probable	Long term
		Reduction of viability of soils in stockpiles.	Medium (-)	Possible	Long term
	TOPOGRAPHY	Alteration of topography.	Low (-)	Probable	Long term
	LAND CAPABILITY	Increased erosion in other areas.	Medium (-)	Possible	Long term
		Reduction in land capability in other areas.	Medium (-)	Probable	Long term
	LAND USE	Loss of access to land.	High (-)	Possible	Long term
		Increased pressure on land.	Low (-)	Possible	Long term
	HYDROLOGICAL AND SURFACE WATER	Contamination of stormwater runoff (quality), caused by: - Sediment release; - Chemicals such as hydrocarbon-based fuels and oils or lubricants spilled from vehicles; - Other chemicals from on-site maintenance activities; - Effluent discharges, due to a lack of stormwater management and system maintenance.	Medium (-)	Possible	Long term
		Impacts on surface water quantity	High (-)	Probable	Short to Medium term
		River characteristics (Beds, Banks, Course)	High (-)	Definite	Long term

ACTIVITY	ENVIRONMENTAL ASPECT	DESCRIPTION OF IMPACT	SIGNIFICANCE PRE-MITIGATION	PROBABILITY	DURATION
IMPACTS DURING THE OPERATIONAL PHASE					
GENERAL IMPACTS					
-Deposition of waste rock onto waste rock dump -Disposal of Tailings to RSF -Maintenance of PCD and other stormwater infrastructure -Dust suppression	GROUNDWATER	Groundwater quantity-lowering of groundwater table and impact on water supply of groundwater table and impact on water supply of groundwater users.	Medium (-)	Possible	Long term
		Groundwater quality – Contamination of groundwater and deterioration of quality down gradient of the mining operations.	High (-)	Possible	Long term
		Groundwater quality – Contamination of groundwater and deterioration of quality as a result of oil, diesel and chemical spills/leaks from machinery and storage facilities.	Medium (-)	Possible	Long term
		Groundwater quality – Contamination of groundwater and deterioration of quality as a result of sewage related contamination.	Medium (-)	Possible	Long term
	TERRESTRIAL BIODIVERSITY (FAUNA AND FLORA)	Potential decrease in biodiversity on the study and surrounding area.	High (-)	Definite	Long term
		Spreading of alien invasive species and bush encroachment of indigenous species.	Medium (-)	Possible	Long term
		Impact on natural local migratory routes and faunal dispersal patterns.	Medium (-)	Possible	Long term
		Disturbance and loss of fauna through noise, light and dust pollution and hunting, trapping and killing of fauna.	Medium (-)	Probable	Long term
	AQUATIC BIODIVERSITY	Damage of Aquatic Ecosystems.	High (-)	Probable	Long term
	VISUAL AND LIGHTING	Visibility from sensitive receptors / visual scarring of the landscape and impact on 'Sense of Place' as a result of the visibility of the mining site.	Medium (-)	Definite	Long term
		Impact of security lighting on surrounding landowners and animals.	Medium (-)	Definite	Long term
	NOISE AND VIBRATION	Nuisance and health risks caused by an increase in the ambient noise level as a result of noise impacts associated with the operation of vehicles, EMV's and equipment, as well as production activities.	Medium (-)	Definite	Long term
		Noise and vibration due to blasting	High (-)	Definite	Long term
	AIR QUALITY	Windborne dust and vehicle fumes altering air quality.	Medium (-)	Definite	Long term

ACTIVITY	ENVIRONMENTAL ASPECT	DESCRIPTION OF IMPACT	SIGNIFICANCE PRE-MITIGATION	PROBABILITY	DURATION
IMPACTS DURING THE OPERATIONAL PHASE					
GENERAL IMPACTS					
		Increased windborne dust from open unrehabilitated areas.	Medium (-)	Definite	Long term
	WASTE (INCLUDING HAZARDOUS WASTE)	Generation and disposal of additional general waste, litter, and hazardous material during the operational phase.	High (-)	Possible	Long term
	SERVICES	Need for services e.g., water, electricity, and sewerage systems, causing additional strain on natural resources and service infrastructure.	Low (-)	Definite	Long term
	SOCIO ECONOMIC	Extended employment provision due to the implementation of the activities, allowing mining activities to continue for additional years.	High (+)	Definite	Medium term
		Continued sourcing supplies from local residents and businesses boosting the local economy for an extended period of time.	Medium (+)	Definite	Medium term
		Operating cost to Samancor	Medium (-)	Definite	Long term
		Strengthening of regional and local economy due to the income and knock-on opportunities.	Medium (+)	Definite	Long term
		Increased pressure on water supply and sanitation as a result of inward migration	Medium (-)	Definite	Long term
		Increase in water-borne diseases, as a result of inward migration and increased pressure on water supply and sanitation.	Medium (-)	Possible	Long term
		Increase in methemoglobinemia due to possible increased nitrate in boreholes.	Medium (-)	Possible	Long term
		Reduction in nutrition and food security as a result of loss of access to subsistence agricultural land.	High (-)	Possible	Long term
		Poorer health care as a result of inward migration and increased pressure on medical resources.	Medium (-)	Possible	Long term
		Increase in sexually transmitted diseases and HIV/AIDS as a result of inward migration.	Medium (-)	Possible	Long term
		Increase in noise and vibration.	Medium (-)	Definite	Long term
		Increase in traffic.	Low (-)	Definite	Long term
		Reduction in sense of place.	Medium (-)	Probable	Long term

ACTIVITY	ENVIRONMENTAL ASPECT	DESCRIPTION OF IMPACT	SIGNIFICANCE PRE-MITIGATION	PROBABILITY	DURATION
IMPACTS DURING THE OPERATIONAL PHASE					
GENERAL IMPACTS					
	TRAFFIC	The change in traffic patterns as a result of traffic entering and exiting the site on the surrounding road infrastructure and existing traffic.	Low (-)	Probable	Long term
	ARCHAEOLOGICAL / CULTURAL	No additional impacts.			

Table 37: Impacts during the decommissioning, closure and post-closure phase

ACTIVITY	ENVIRONMENTAL ASPECT	DESCRIPTION OF IMPACT	SIGNIFICANCE PRE-MITIGATION	PROBABILITY	DURATION
IMPACTS DURING THE DECOMMISSIONING, CLOSURE AND POST-CLOSURE PHASES					
GENERAL IMPACTS					
-Backfilling and landscaping -Topsoil placement and reseeding concurrent rehabilitation Monitoring of rehabilitated areas	GEOLOGY AND SOILS	Contamination of soils through: - Accidental spillage of chemicals such as hydrocarbon-based fuels and oils or lubricants spilled from heavy duty vehicles and other chemicals. - Vehicle and personnel activities as well as storage of materials & equipment, compaction, and degradation impacts	Medium (-)	Possible	Short term
		Vehicle and personnel, as well as storage of materials, equipment and stockpiling, compaction and degradation impacts.	Low (-)	Probable	Medium term
		Disturbance of in-situ geology.	Medium (-)	Probable	Long term
		Mixing and dilution of soils.	Medium (-)	Probable	Long term
		Erosion of replaced soils.	Medium (-)	Probable	Long term
		Reduction of viability of replaced soils.	Medium (-)	Possible	Long term
	TOPOGRAPHY	Alteration of topography.	Medium (-)	Probable	Long term
	LAND CAPABILITY	Reduction in land capability when available once more.	Low (-)	Possible	Long term
	LAND USE	Loss of access to land.	High (-)	Possible	Long term

ACTIVITY	ENVIRONMENTAL ASPECT	DESCRIPTION OF IMPACT	SIGNIFICANCE PRE-MITIGATION	PROBABILITY	DURATION
IMPACTS DURING THE DECOMMISSIONING, CLOSURE AND POST-CLOSURE PHASES					
GENERAL IMPACTS					
	SURFACE WATER AND HYDROLOGY	Contamination of stormwater runoff, caused by: - Sediment release; - Chemicals such as hydrocarbon-based fuels and oils or lubricants spilled from heavy duty vehicles; - Effluent discharges, due to a lack of stormwater management.	Medium (-)	Possible	Short term
		Surface water quality.	Medium (-)	Probable	Medium term
		Surface water quantity.	Medium (-)	Possible	Long term
		River characteristics (Beds, Banks, Course)	High (-)	Possible	Long term
	GROUNDWATER	Groundwater quantity – change in groundwater level and the potential (positive) impact on base flow of streams.	Medium (+)	Possible	Long term
		Groundwater quality – Deterioration of groundwater quality down gradient of the mining operations due to plume movement.	High (-)	Possible	Long term
		Groundwater quality deterioration as a result of contaminants emanating from historic oil, diesel and chemical spills and facilities.	Medium (-)	Possible	Long term
	TERRESTRIAL BIODIVERSITY (FAUNA AND FLORA)	Disturbance and loss of fauna through noise, light, and dust pollution as well as hunting, trapping and killing of fauna.	Low (-)	Definite	Long term
		Increase of alien invasive species.	Medium (-)	Probable	Short term
	AQUATIC BIODIVERSITY	Damage to Aquatic Ecosystems.	High (-)	Possible	Long term
	VISUAL AND LIGHTING	Visibility from sensitive receptors / visual scarring of the landscape as a result of the closure and rehabilitation activities.	Medium (-)	Definite	Short term
		Impact of security lighting on surrounding landowners and animals.	Medium (-)	Definite	Short term
	NOISE AND VIBRATION	Noise and vibration caused by an increase in the ambient noise level as a result of noise impacts associated with the operation of heavy-duty vehicles and equipment.	Low (-)	Definite	Short term
	AIR QUALITY	Dust pollution due to rehabilitation activities and heavy-duty vehicles.	Medium (-)	Definite	Short term

ACTIVITY	ENVIRONMENTAL ASPECT	DESCRIPTION OF IMPACT	SIGNIFICANCE PRE-MITIGATION	PROBABILITY	DURATION
IMPACTS DURING THE DECOMMISSIONING, CLOSURE AND POST-CLOSURE PHASES					
GENERAL IMPACTS					
		Cumulative reduction in air quality	Medium (-)	Possible	Short term
	SOCIO-ECONOMIC	Decommissioning and Closure cost to Samancor.	Medium (-)	Definite	Short term
		Strengthening of regional and local economy due to the income and knock-on opportunities.	Medium (+)	Definite	Short term
		Increased pressure on water supply and sanitation as a result of inward migration.	Medium (-)	Probable	Short term
		Increase in waterborne diseases, as a result of inward migration and increased pressure on water supply and sanitation.	Medium (-)	Possible	Short term
		Increase in health risk due to increased nitrate in borehole water.	Medium (-)	Possible	Medium term
		Poorer health care as a result of inward migration and increased pressure on medical resources.	Medium (-)	Possible	Medium term
		Reduction in sense of place.	Medium (-)	Possible	Medium term
	ARCHAEOLOGICAL / CULTURAL	No additional impact.	N/A	N/A	N/A

Table 38: Impacts as a result of general impacts on all phases

ACTIVITY	ENVIRONMENTAL ASPECT	DESCRIPTION OF IMPACT	SIGNIFICANCE PRE-MITIGATION	PROBABILITY	DURATION
ALL PHASES					
All activities	GROUNDWATER	Acid Mine Drainage	Low (-)	Possible	Long term
	SOCIO-ECONOMIC	Loss of income from agriculture land	High (-)	Definite	Long term
		Economic impact of supporting other households	High (-)	Definite	Long term
		Population growth	Low (-)	Possible	Long term
		Increased pressure on existing infrastructure	Medium (-)	Possible	Long term
		Social conflict due to possible inward migration of outsiders, associated effects and competition for benefits within and between communities.	Medium (-)	Probable	Long term

Table 39: Impacts as a result of cumulative impacts

ACTIVITY	ENVIRONMENTAL ASPECT	DESCRIPTION OF IMPACT	SIGNIFICANCE PRE-MITIGATION	PROBABILITY	DURATION
ALL PHASES					
General mining activities	All of the above	All of the above	Medium (-)	Possible	Long term

Table 40: Impacts as a result of not implementing the proposed Mareesburg Chrome mine

ACTIVITY	ENVIRONMENTAL ASPECT	DESCRIPTION OF IMPACT	SIGNIFICANCE PRE-MITIGATION	PROBABILITY	DURATION
NO-GO ALTERNATIVE					
N/A	SOCIO-ECONOMIC	No employment for residents and skills transfer to unskilled and semi-skilled unemployed individuals.	Very high (-)	Definite	Permanent
		No development and upliftment of the surrounding communities and infrastructure.	Very high (-)	Definite	Permanent
		No development of the economic environment, by job creation and sourcing supplies for and from local residents and businesses.	Very high (-)	Definite	Permanent

11.1 METHODOLOGY USED IN DETERMINING THE SIGNIFICANCE OF ENVIRONMENTAL IMPACTS

The significance, probability, and duration of the aforesaid identified impacts that were identified through the consultation process were determined in order to decide the extent to which the initial site layout needs revision.

A "significant impact" is defined as it is defined in the EIA Regulations, 2014 (as amended): "an impact that may have a notable effect on one or more aspects of the environment or may result in non-compliance with accepted environmental quality standards, thresholds or targets and is determined through rating the positive and negative effects of an impact on the environment based on criteria such as duration, magnitude, intensity and probability of occurrence". The objective of this EIA methodology is to serve as framework for accurately evaluating impacts associated with current or proposed activities in the biophysical, social and socio-economical spheres. It aims to ensure that all legal requirements and environmental considerations are met in order to have a complete and integrated environmental framework for impact evaluations.

The process of determining impacts to be assessed is one of the most important parts of the environmental impact assessment process. It is of such high importance because the environmental impacts identified can and are often linked to the same impact stream. In this method all impacts on the biophysical environment are assessed in terms of the overall integrity of ecosystems, habitats, populations, and individuals affected. For example, the removal of groundcover for the sloping or scraping of an embankment, can lead to higher amounts of water runoff which increases the rate of erosion. Further down in the river the amount of sediment increases because of the increased erosion. A number of fish species cannot endure the high amount of sediment and moves off. The habitat is thus changed or in the process of changing. Thus, one needs to understand that the root of the problem (removal of groundcover) is assessed in terms of the degree of change in the health of the environment and/or components in relation to their conservation value. If the impact of removal of groundcover of a definable system is high and the conservation value is also high then the impact of removal of groundcover is highly significant.

11.2 ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REGULATIONS, 2014 [AS AMENDED] REQUIREMENTS

The Environmental Impact Assessment (EIA) 2014 Regulations promulgated in terms of Sections 24 (5), 24M and 44 of the National Environmental Management Act, 1998 (Act No. 107 of 1998) [as amended] (NEMA), requires that all identified potential impacts associated with the proposed project be assessed in terms of their overall potential significance on the natural, social, and economic environments. The criteria identified in the EIA Regulations, 2014 (as amended), include the following:

- Nature of the impact;
- Extent of the impact;
- Duration of the impact
- Probability of the impact occurring;
- Degree to which impact can be reversed;

- Degree to which impact may cause irreplaceable loss of resources;
- Degree to which the impact can be mitigated; and
- Cumulative impacts.

ENVASS has developed an impact assessment methodology (as defined below) whereby the Significance of a potential impact is determined through the assessment of the relevant temporal and spatial scales determined of the Extent, Magnitude and Duration criteria associated with a particular impact. This method does not explicitly define each of the criteria but rather combines them and results in an indication of the overall significance.

11.3 ENVASS IMPACT ASSESSMENT METHODOLOGY

11.3.1 Nature of the impact

The NATURE of an impact can be defined as: "a *brief description of the impact being assessed, in terms of the proposed activity or project, including the socio-economic or environmental aspect affected by this impact*".

11.3.2 The status of the impact

	Status	Description
STATUS	**Positive (+)**	A benefit to the holistic environment
	Negative (-)	A cost to the holistic environment
	Neutral (N)	No cost or benefit to the holistic environment

11.3.3 Magnitude of the impact

The MAGNITUDE of an impact can be defined as: "*a brief description of the intensity or amplitude of the impact on socio-economic or environmental aspects".*

Determining the magnitude of an impact			
	Magnitude	**Score**	**Description**
MAGNITUDE **Magnitude / intensity of impact (at the specified scale)**	**Zero**	**1**	Natural and/or social functions and/or processes remain unaltered
	Very low	**2**	Natural and/or social functions and/or processes are negligibly altered
	Low	**3**	Natural and/or social functions and/or processes are slightly altered
	Medium	**4**	Natural and/or social functions and/or processes are notably altered
	High	**5**	Natural and/or social functions and/or processes severely altered

11.3.4 Extent of the impact

The EXTENT of an impact can be defined as: "*a brief description of the spatial influence of the impact or the area that will be affected by the impact*".

Determining the extent of an impact			
EXTENT Extent or spatial influence of impact	Extent	Score	Description
	Footprint	1	Only as far as the activity, such as footprint occurring within the total site area
	Site	2	Only the site and/or 500m radius from the site will be affected
	Local	3	Local area / district (neighbouring properties, transport routes and adjacent towns) is affected
	Region	4	Entire region / province is affected
	National	5	Country is affected

11.3.5 Duration of the impact

The DURATION of an impact can be defined as: "*a short description of the period of time the impact will have an effect on aspects*".

Determining the duration of an impact			
DURATION Duration of the impact	Extent	Score	Description
	Short term	1	Less than 2 years
	Short to medium term	2	2 – 5 years
	Medium term	3	6 – 25 years
	Long term	4	26 – 45 years
	Permanent	5	46 years or more

11.3.6 Probability of the impact occurring

The PROBABILITY of an impact can be defined as: "the *estimated chance of the impact happening*".

Determining the probability of an impact			
PROBABILITY	Probability	Score	Description
	Unlikely	1	Unlikely to occur (0 – 15% probability of impact occurring)
	Possible	2	May occur (15 – 40% chance of occurring)
	Probable	3	Likely to occur (40– 60% chance of occurring)
	Highly Probable	4	Between 60% and 85% sure that the impact will occur
	Definite	5	Will certainly occur (85 - 100% chance of occurring)

11.3.7 Degree to which impact can be reversed

The REVERSIBILITY of an impact can be defined as: *"the ability of an impact to be changed from a state of affecting aspects to a state of not affecting aspects*".

Determining the probability of an impact			
	Reversibility	Score	Description
REVERSIBILITY	Completely reversible	1	Will reverse with minimal rehabilitation & negligible residual affects
	Partly reversible	2	Impacts can be reversed through the implementation of mitigation measures
	Irreversible	3	Impacts are permanent and can't be reversed by the implementation of mitigation measures or rehabilitation is not viable

11.3.8 Degree to which impact may cause irreplaceable loss of resources

The irreplaceability of an impact can be defined as "the amount of resources that can/can't be replaced".

Irreplaceability = Magnitude + Extent + Duration + Reversibility

IRREPLACEABILITY Irreplaceable loss of resources	No loss	No loss of any resources
	Low	Marginal loss or resources
	Medium	Significant loss of resources
	High	Complete loss of resources

11.3.9 Degree to which the impact can be mitigated

The degree to which an impact can be MITIGATED can be defined as: "the effect of mitigation measures on the impact and its degree of effectiveness".

Determining the mitigation rating of an impact			
MITIGATION RATING	MITIGATED Degree impact can be mitigated	High	Impact 100% mitigated
		Medium	Impact >50% mitigated
		Low	Impact <50% mitigated

11.3.10 Confidence rating

CONFIDENCE in the assessment of an impact can be defined as the:" *level of certainty of the impact occurring*".

Determining the confidence rating of an impact			
CONFIDENCE RATING	CONFIDENCE	Certain	Amount of information on and/or understanding of the environmental factors that potentially influence the impact is *unlimited and sound*
		Sure	Amount of information on and/or understanding of the environmental factors that potentially influence the impact is *reasonable and relatively sound*
		Unsure	Amount of information on and/or understanding of the environmental factors that potentially influence the impact is *limited*

11.3.11 Cumulative impacts

The effect of CUMULATIVE impacts can be described as:" the effect the combination of past, present and "reasonably foreseeable" future actions have on aspects".

Determining the confidence rating of an impact			
CUMULATIVE RATING	**CUMULATIVE EFFECTS**	Low	*Minor* cumulative effects
		Medium	*Moderate* cumulative effects
		High	*Significant* cumulative effects

11.3.12 Significance of Impacts

The SIGNIFICANCE can be defined as:" *the combination of the duration and importance of the impact, in terms of physical and socio-economic extent, resulting in an indicative level of mitigation required*".

The significance of an impact is determined as follows:

Significance = Irreversibility x Probability

Table 41: Significance Rating

Score	Significance	Description
0	**Neutral**	• Zero magnitude with any combination of extent and duration.
1 to 20	**Very low**	• Very low magnitude with any combination of extent and duration except regional and long term. • Low magnitude with a site-specific extent and short-term duration.
		• Very low magnitude with a site-specific extent and regional or long-term duration. • Low magnitude with any combination of extent and duration except site specific and short, regional, or long-term duration. • Medium magnitude with a site-specific extent and short-, medium- or long-term duration. • High magnitude with a site-specific extent and short-term duration.
21 to 40	**Low**	• Low magnitude with a regional extent and long-term duration. • Medium magnitude with any combination of extent and duration except site specific and short, regional or long-term duration. • High magnitude with either a local extent and short-term duration or a site-specific extent and medium-term duration.

Score	Significance	Description
		• High magnitude with a regional extent and short-term duration or a site-specific extent and long-term duration. • High magnitude with a local extent and medium-term duration.
		• Medium magnitude with a regional extent and long-term duration. • High magnitude with either a regional extent and medium-term duration or a local extent and long-term duration.
		• Medium magnitude with a national extent and long-term duration. • High magnitude with either a regional extent and long-term duration or a national extent and long-term duration. • Zero magnitude with any combination of extent and duration.
41 to 60	**Medium**	• Very low magnitude with any combination of extent and duration except regional and long term. • Low magnitude with a site-specific extent and short-term duration.
		• Very low magnitude with a site-specific extent and regional or long-term duration; • Low magnitude with any combination of extent and duration except site specific and short, regional, or long-term duration • Medium magnitude with a site-specific extent and short-, medium- or long-term duration • High magnitude with a site-specific extent and short-term duration.
		• Low magnitude with a regional extent and long-term duration. • Medium magnitude with any combination of extent and duration except site specific and short, regional, or long-term duration. • High magnitude with either a local extent and short-term duration or a site-specific extent and medium-term duration. • High magnitude with a regional extent and short-term duration or a site-specific extent and long-term duration. • High magnitude with a local extent and medium-term duration.
		• Medium magnitude with a regional extent and long-term duration. • High magnitude with either a regional extent or medium term. duration or a local extent and long-term duration.

Score	Significance	Description
		• Medium magnitude with a national extent and long-term duration. • High magnitude with either a regional extent and long-term duration or a national extent and long-term duration.
		• Zero magnitude with any combination of extent and duration.
61 to 80	High	• Very low magnitude with any combination of extent and duration except regional and long term. • Low magnitude with a site-specific extent and short-term duration.
		• Very low magnitude with a site-specific extent and regional or long-term duration. • Low magnitude with any combination of extent and duration except site specific and short, regional, or long-term duration • Medium magnitude with a site-specific extent and short-, medium- or long-term duration. • High magnitude with a site-specific extent and short-term duration.
		• Low magnitude with a regional extent and long-term duration. • Medium magnitude with any combination of extent and duration except site specific and short, regional, or long-term duration. • High magnitude with either a local extent and short-term duration or a site-specific extent and medium-term duration. • High magnitude with a regional extent and short-term duration or a site-specific extent and long-term duration. • High magnitude with a local extent and medium-term duration.
81 to 100	Very high	• Medium magnitude with a regional extent and long-term duration. • High magnitude with either a regional extent and medium-term duration or a local extent and long-term duration.
		• Medium magnitude with a national extent and long-term duration. • High magnitude with either a regional extent and long-term duration or a national extent and long-term duration.

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

A discussion in terms of advantages and disadvantages of the initial site layout compared to alternative layout options to accommodate concerns raised by affected parties.

Mining the whole Mining Right Area with a Biodiversity Offset (preferred alternative)

The preferred alternative provides an opportunity to maximise the life of mine as all ore reserve available for abstraction will be mined and processed, creating the maximum number of job opportunities and other knock-on economic advantages such as sub-contract work and local economic development projects. This alternative optimises the investment capital made by Samancor for the feasibility, planning and environmental processes towards the Mareesburg Chrome Mine. Should this alternative however be approved, valuable biodiversity resources would be lost and need to be established on a different site. In addition, a river will have to be diverted around mine works areas in order to prevent pollution impacts on the river as a result of mining.

Exclusion of High Sensitivity areas as identified during specialist assessments

For this alternative, areas of high sensitivity will be excluded from the mining area, with mining taking place around buffer areas identified by specialists. This will decrease the socio-economic advantages as the volume of ore that will be available for mining will decrease, decreasing the life of mine. The investment capital made by Samancor is not optimised, however, sensitive environmental features are retained and protected.

Not implementing the activities

Local, regional, and national socio-economic environment will not benefit from the mining activities, should the proposed Mareesburg Chrome Mine not be approved, and the identified direct and cumulative negative environmental impacts would not take place.

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

A list of issues and concerns raised by affected parties and an assessment/ discussion of the mitigations or site layout alternatives available to accommodate or address their concerns, together with an assessment of the impacts or risks associated with the mitigation or alternatives considered.

Issues raised during the commenting period of the scoping report will be incorporated in the final Scoping Report to be submitted to the CA.

11.6 THE OUTCOME OF THE SITE SELECTION MATRIX. FINAL SITE LAYOUT PLAN

A final site layout plan as informed by the process of consultation with interested and affected parties.

The final site layout plan will be described in the EIR / EMPR once all specialist and engineering designs have been completed and comments from I&APs have been received. Please refer to Appendix 4 for a preliminary layout of the operations and activities.

11.7 MOTIVATION WHERE NO ALTERNATIVE SITES WERE CONSIDERED

Not applicable to this application.

11.8 STATEMENT MOTIVATING THE PREFERRED SITE

A statement motivation for the final site layout that is proposed.

The final site layout plan will be described in the EIR / EMPR once all specialist and engineering designs have been completed and comments from I&APs have been received. Please refer to Appendix 4 for a preliminary layout of the operations and activities.

B. PLAN OF STUDY FOR THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

Appendix 2 of the EIA Regulations, 2014 (as amended) requires that the Scoping Report contain a plan of scoping for undertaking the next phase, which is the EIA process. The specific reporting requirements are as follows:

According to Appendix 2, Section 2(1),of the EIA Regulations 2014 (as amended) a "scoping report must contain the information that is necessary for a proper understanding of the process, informing all preferred alternatives, including location alternatives, the scope of the assessment, and the consultation process to be undertaken through the environmental impact assessment process, and must include -

(h) a plan of study for undertaking the environmental impact assessment process to be undertaken, including—

- *(i) a description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity;*
- *(ii) a description of the aspects to be assessed as part of the environmental impact assessment process;*
- *(iii) aspects to be assessed by specialists;*
- *(iv) a description of the proposed method of assessing the environmental aspects, including aspects to be assessed by specialists;*
- *(v) a description of the proposed method of assessing duration and significance;*
- *(vi) an indication of the stages at which the competent authority will be consulted;*
- *(vii) particulars of the public participation process that will be conducted during the environmental impact assessment process; and*
- *(viii) a description of the tasks that will be undertaken as part of the environmental impact assessment process;*
- *(ix) identify suitable 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*

The plan of study for undertaking the EIA process is part of the draft Scoping Report that is made available to I&APs for comment during Scoping. In response to I&AP comments, including those from the respective authorities and input from specialists, the plan of study will be revised in the final Scoping Report. The competent authority will consider the final Scoping Report in relation to the comments submitted by I&AP and stakeholders during Scoping Phase and will advise if the plan of study is accepted.

The issues and impacts that are identified through Scoping will be taken through a more detailed assessment and subjected to a second round of public participation. The plan of study for EIA thus proposes how this will be done. An Environmental Management Programme (EMPr) will also be compiled during the EIA phase and inter alia contain the mitigation measures to either avoid or minimise and remedy the identified impacts. It too will be subjected to public participation during the EIA Phase, as will the specialist reports.

1 DESCRIPTION OF ALTERNATIVES TO BE CONSIDERED INCLUDING THE OPTION OF NOT GOING AHEAD WITH THE ACTIVITY.

The following alternatives were investigated as part of the scoping phase:

- The site on which the proposed Mareesburg Chrome Mine is to be located – (site and layout alternatives);
- Technology alternatives - Different Methods of mining.
- Routing – Different routes to access the site.
- Transport – Different ways of transporting mined product.
- Scale – Different layout alternatives could influence the scale alternatives due to availability of ore.
- No-go alternative – The option of not undertaking and implementing the activity.

1.1 THE SITE ON WHICH THE MINE IS TO BE LOCATED – LOCATION ALTERNATIVES

Mining the whole Mining Right Area (preferred alternative)

Mining the whole of the Mining Right area will yield optimal ore body, therefore, extending life of mine to a maximum and increasing job opportunities and the contribution to the local economic development. This alternative has a possibility of impacting on the receiving environment, specifically aspects related to:

- Terrestrial Biodiversity;
- Aquatic Biodiversity;
- Archaeological and Heritage artifacts; and
- Land Capability.

Exclusion of areas assessed by specialists to have a high environmental sensitivity

The preferred alternative will be reassessed during the EIA phase by taking into consideration the findings and recommendations of the relevant specialist studies, which may impact on the location and layout of the proposed mining operations.

1.1.1 Technology Alternatives - Different Methods of Mining

As with the design alternatives the layout alternatives are limited by the availability of the reserves and environmental and infrastructure barriers. The following preliminary alternative assessment has been completed:

Mining the whole Mining Right Area (preferred alternative)

Mining the whole of the Mining Right area will yield optimal ore body, therefore, extending life of mine to a maximum and increasing job opportunities and the contribution to the local economic development. This alternative has a possibility of impacting on the receiving environment, specifically aspects related to:

- Terrestrial Biodiversity;
- Aquatic Biodiversity;
- Archaeological and Heritage artifacts; and

- Land Capability.

Exclusion of areas assessed by specialists to have a high environmental sensitivity

The preferred alternative will be reassessed during the EIA phase by taking into consideration the findings and recommendations of the relevant specialist studies, which may impact on the location and layout of the proposed mining operations.

1.1.2 Transport

Road (preferred alternative)

All final products will be trucked from site as infrastructure is well established and there is little need for infrastructure upgrades for access and haul roads.

Railway

There is no railway line situated on the proposed mining area and therefore the required railway infrastructure will need to be constructure. This is therefore not regarded as the preferred alternative.

1.1.3 No-Go Alternative

Should the proposed Mareesburg Chrome Mine not be approved Local the regional, and national socio-economic environment will not benefit from the mining activities and the identified direct and cumulative negative environmental impacts would not take place.

1.2 DESCRIPTION OF THE ASPECTS TO BE ASSESSED AS PART OF THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

Assessment of the aspects affected by each individual mining activity whether listed or not, including activities such as blasting, Loading, hauling and transport, and mining activities such as Excavations, stockpiles, discard dumps or dams, water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc.).

The following aspects will be assessed as part of the environmental assessment process:

- Topography;
- Geology and Soils;
- Land Capability;
- Land Use;
- Geohydrology;
- Hydrology and Surface Water;
- Terrestrial Biodiversity;
- Aquatic Biodiversity;
- Aesthetic quality (visual and lighting);

- Noise and Vibration;
- Socio-economic;
- Air Quality;
- Waste;
- Traffic;
- Palaeontological aspects; and
- Archaeological aspects.

1.3 DESCRIPTION OF ASPECTS TO BE ASSESSED BY SPECIALISTS

The National Web based Environmental Screening Tool is a geographically based web-enabled application which allows a proponent intending to submit an application for environmental authorization in terms of the Environmental Impact Assessment Regulations (2014), to screen their proposed site for any environmental sensitivity.

The Screening Tool also provides site specific EIA process and review information, for example, the Screening Tool may identify if an industrial development zone, minimum information requirement, Environmental Management Framework or bio-regional plan applies to a specific area.

Some of these documents can then be accessed through the Screening Tool via links, for consideration during screening.

Further to this, the Screening Tool identifies exclusions and/ or specific requirements including specialist studies applicable to the proposed site and/or development, based on the national sector classification and the environmental sensitivity of the site.

1.3.1 Mareesburg Chrome Mine Screening

Figure 288 to Figure 34 below provides the environmental sensitivities for the proposed Mareesburg Chrome Mine as identified by the web-based screening tool.

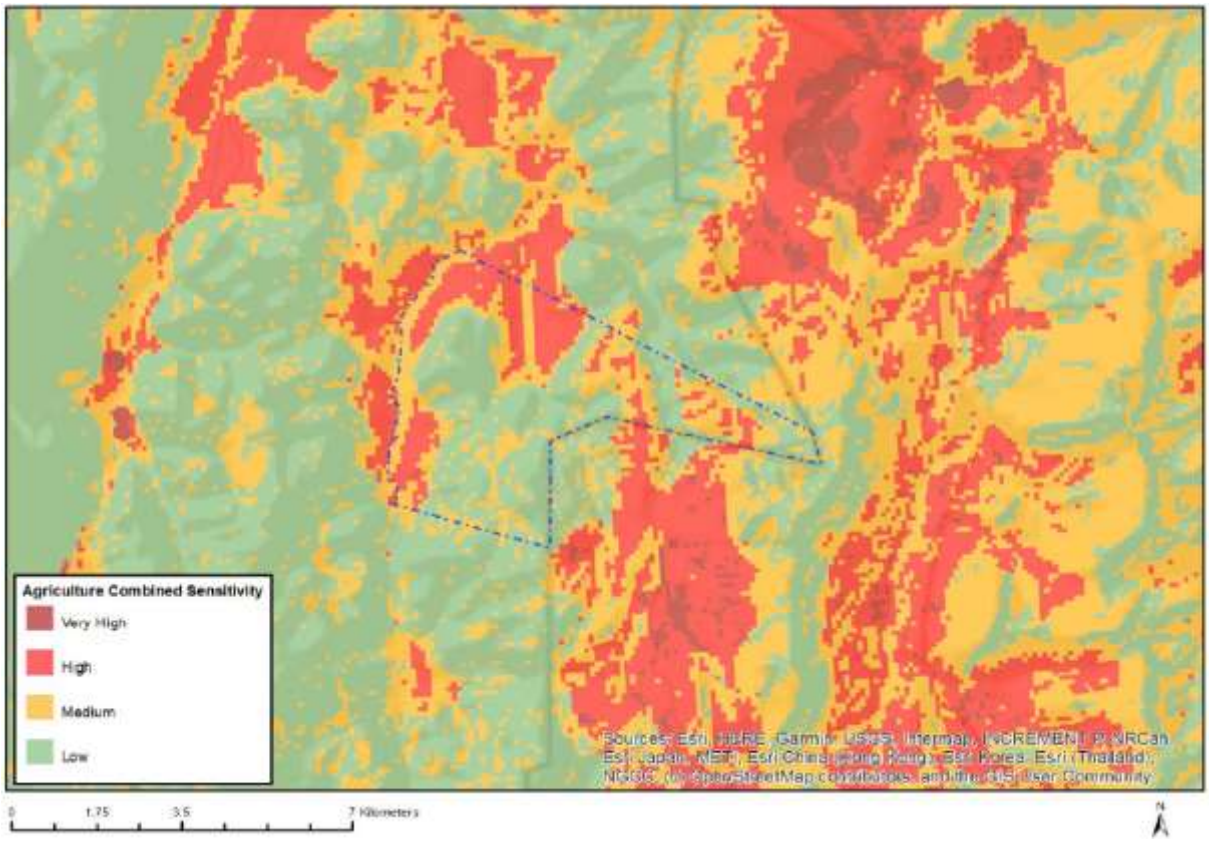


Figure 28: Map of Agricultural Sensitivity

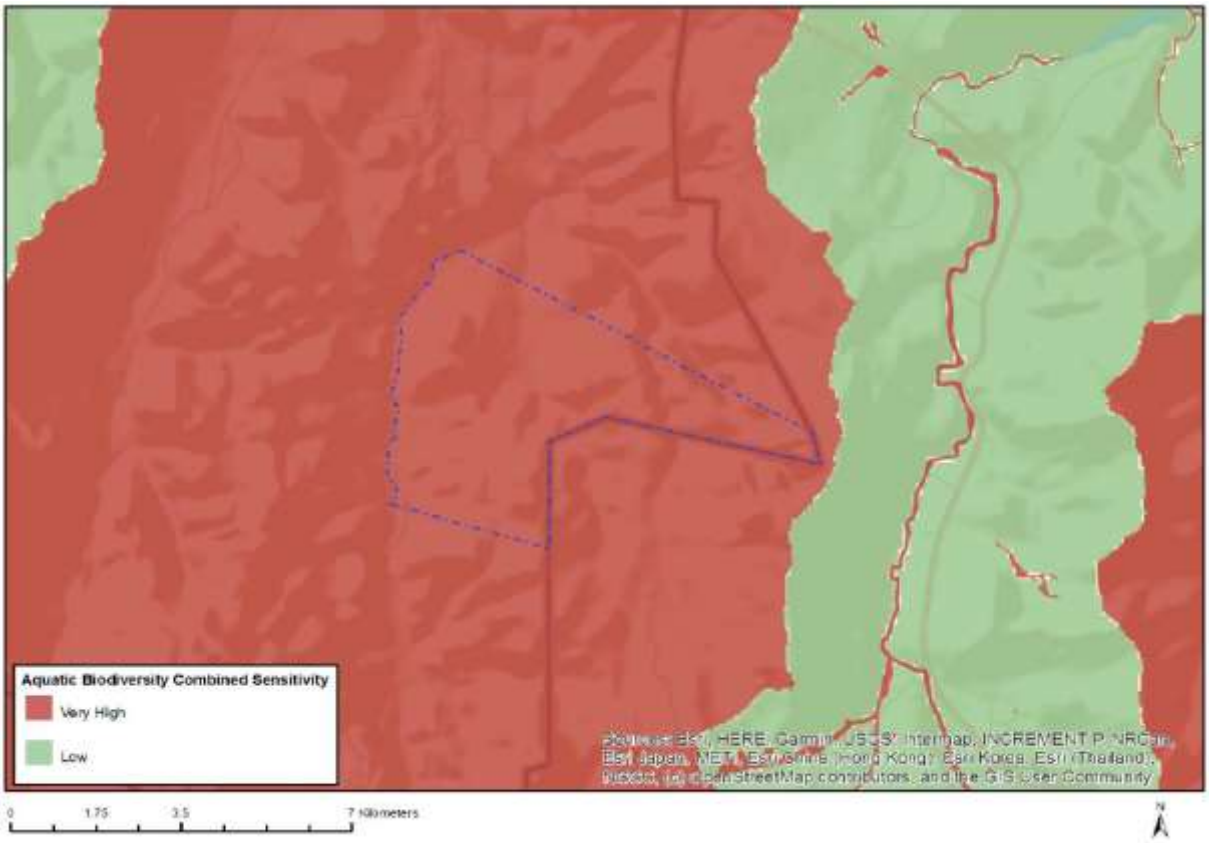


Figure 29: Map of Aquatic Biodiversity Sensitivity

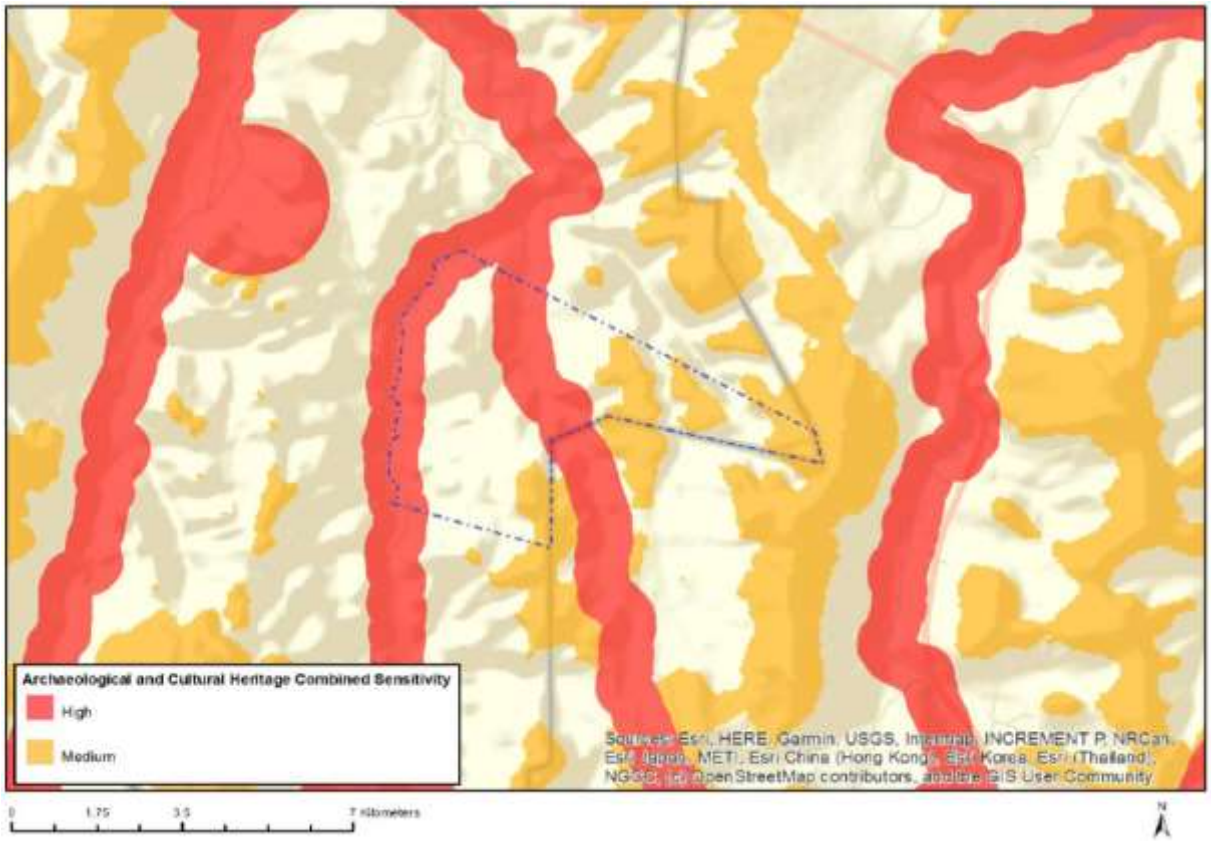


Figure 30: Map of Archeological Sensitivity

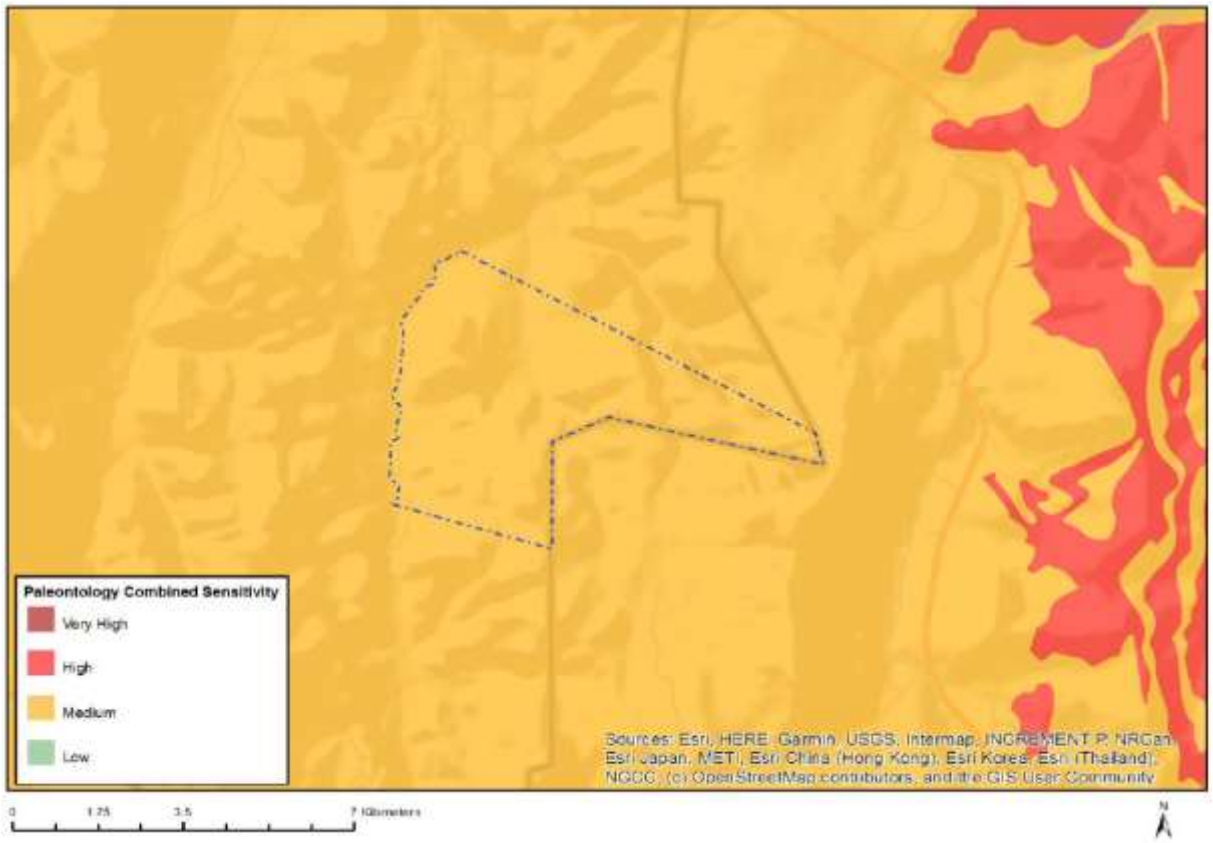


Figure 31: Map of Palaeontological Sensitivity

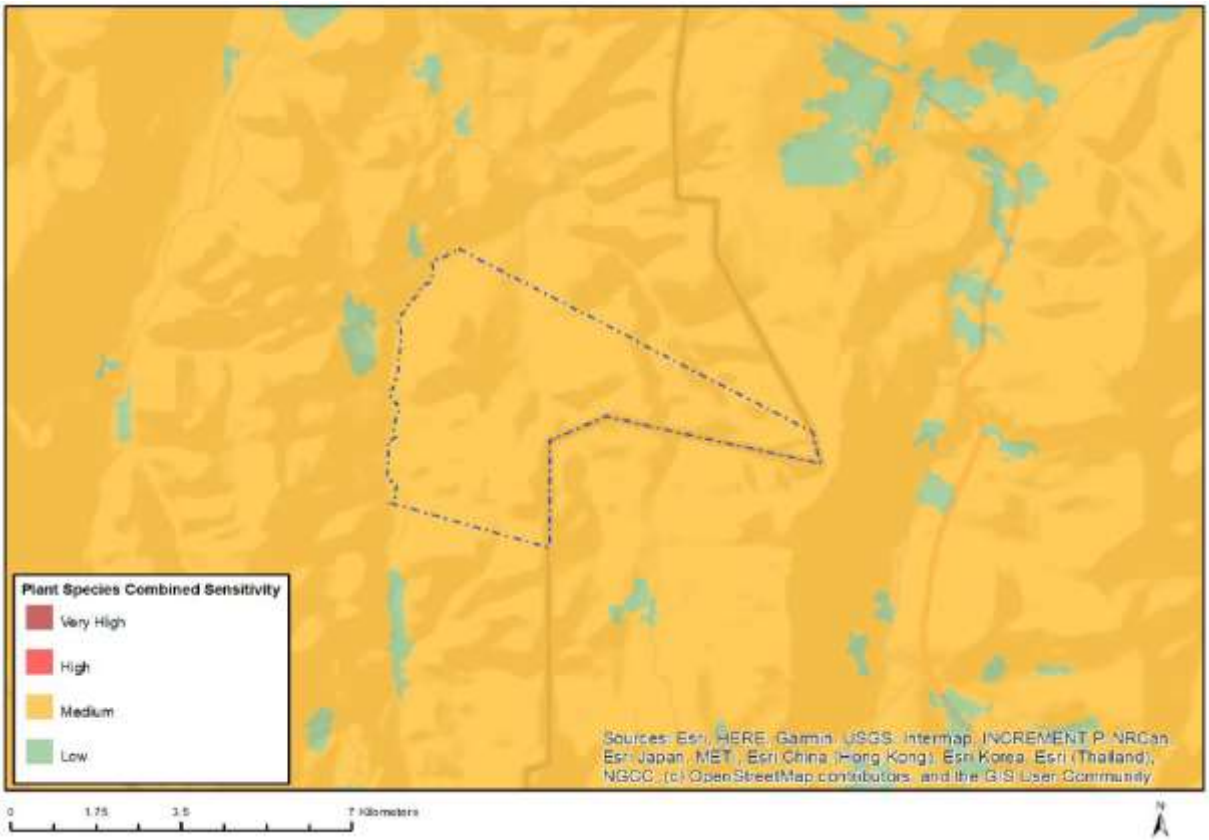


Figure 32: Map of Plant Sensitivity

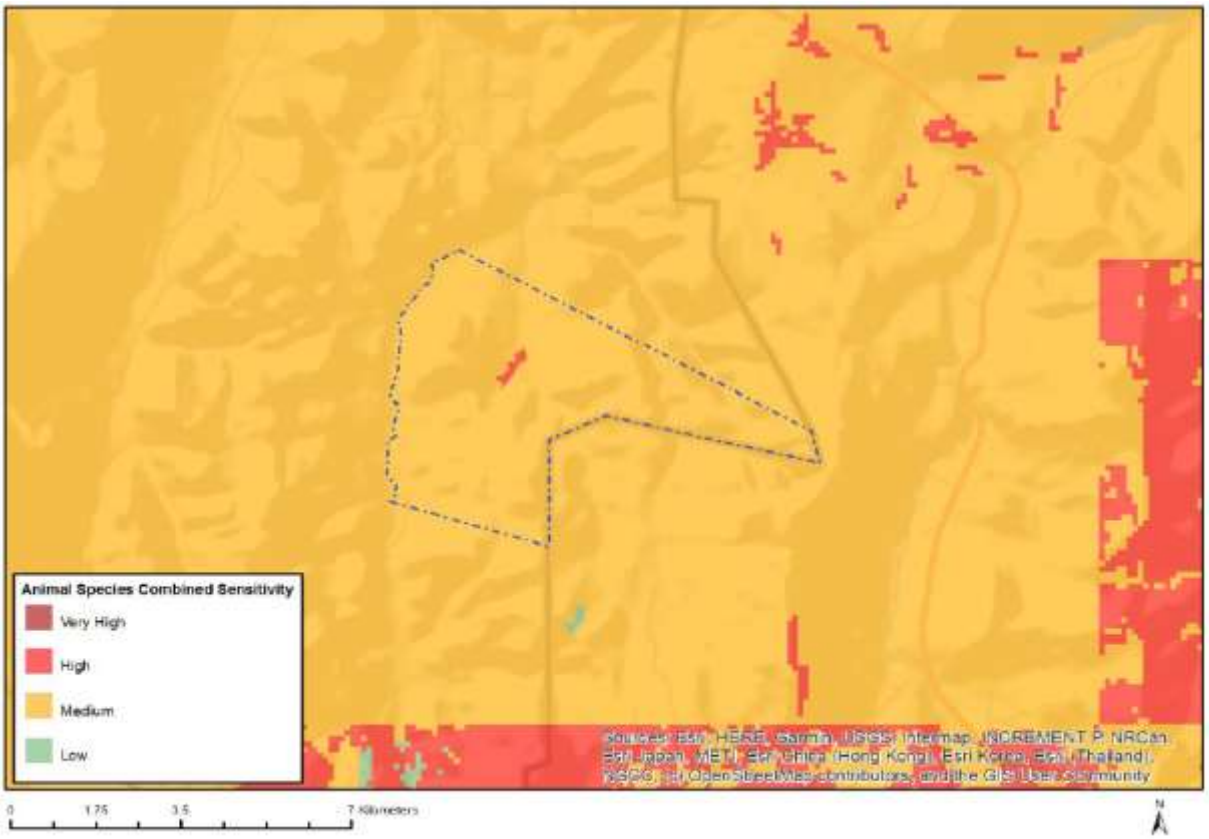


Figure 33: Map of Animal Sensitivity

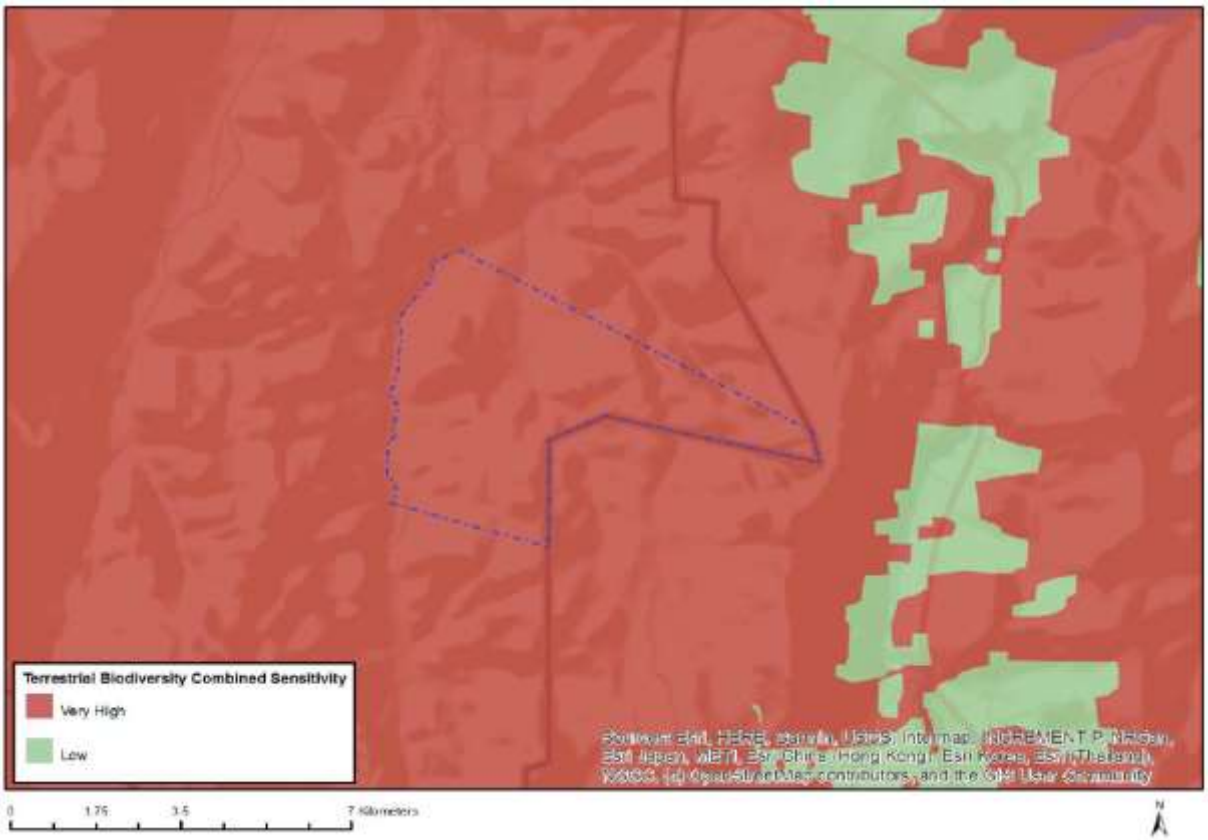


Figure 34: Map of Terrestrial Biodiversity Sensitivity

1.3.2 Specialist Studies Recommended by the EIA Screening Tool

Based on the selected classification, and the environmental sensitivities of the proposed development footprint, the following list of specialist assessments have been identified for inclusion in the assessment report. It is the responsibility of the EAP to confirm this list and to motivate in the assessment report, the reason for not including any of the identified specialist study including the provision of photographic evidence of the site situation.

Table 42: Specialist Studies

Specialist Study	Assessment Protocol	Motivation on Applicability to this project
Agricultural Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/Assessment/General/DraftAgricultureProtocol.pdf	Applicable
Landscape/Visual Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/Assessment/General/Appendix6.pdf	Applicable
Archaeological and Cultural Heritage Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/Assessment/General/Appendix6.pdf	Applicable
Palaeontology Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/Assessment/General/Appendix6.pdf	Applicable
Terrestrial Biodiversity Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/Assessment/General/Appendix6.pdf	Applicable

Specialist Study	Assessment Protocol	Motivation on Applicability to this project
Aquatic Biodiversity Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/Assessment/General/Appendix6.pdf	Applicable
Hydrology Assessment	https://screening.environment.gov.za/ScreeningDownloads/Assessment/General/Appendix6.pdf	A Detailed Stormwater Management Plan is being conducted inclusive of flood line delineation.
Noise Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/Assessment/General/Appendix6.pdf	Applicable
Radioactivity Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/Assessment/General/Appendix6.pdf	Not Applicable. No radioactive material is expected in the area based on the results of prospecting.
Traffic Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/Assessment/General/Appendix6.pdf	Applicable
Geotechnical Assessment	https://screening.environment.gov.za/ScreeningDownloads/Assessment/General/Appendix6.pdf	Applicable
Climate Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/Assessment/General/Appendix6.pdf	Not Applicable. The scale of the activity is not expected to provide significant climatic impact.
Health Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/Assessment/General/Appendix6.pdf	Not Applicable. The type of activity and the location of the mine is expected not to have a significant impact on human health
Socio- Economic Assessment	https://screening.environment.gov.za/ScreeningDownloads/Assessment/General/Appendix6.pdf	Applicable
Ambient Air Quality Impact	https://screening.environment.gov.za/ScreeningDownloads/Assessment/General/Appendix6.pdf	Applicable
Seismicity Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_General_Requirement_Assessment_Protocols.pdf	Not Applicable.
Plant Species Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_Plant_Species_Assessment_Protocols.pdf	Applicable. Will be included into the Terrestrial Biodiversity Assessment.
Animal Species Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_Animal_Species_Assessment_Protocols.pdf	Applicable. Will be included into the Terrestrial Biodiversity Assessment.

1.3.3 Specialist Studies that will be included in the EIA

Based on the EIA Screening tool used the following list of specialist assessments have been identified for inclusion by the EAP:

Table 43: Description of aspects to be assessed by specialists

Aspect	Specialist Study	Specialist
Mine	Conceptual and Final Design Report and Designs	Samancor Chrome Limited
Geohydrology	Geohydrological Study	MVB Consulting
Biodiversity	Terrestrial Biodiversity Impact Assessment (Fauna and Flora)	The Biodiversity Company
Dust fallout	Ambient Air Quality Impact Assessment	EScience Associates (Pty) Ltd
Palaeontology	Palaeontological Impact Assessment	Dr Heidi Fourie
Heritage Impact Assessment	Phase 1 Archaeological Impact Assessment	Agri Civils Geo-Tech & Heritage
Land Profile – Agricultural Potential	Archaeological Impact Assessment	EnviroGIS Pty Ltd
Noise and Vibration	Blasting, Noise and Vibration Impact Assessment	Geotheta
Ground Stability	Geotechnical Impact Assessment	Geotheta
Socio Economic	Socio-Economic Impact Assessment	Urban Econ
Traffic	Traffic Impact Assessment	Mariteng Consulting Engineers (Pty) Ltd.
Aesthetics	Visual Impact Assessment	ENVASS
Aquatic Biodiversity	Aquatic Biodiversity Impact Assessment, Wetland Delineation and c&i Risk Assessment	ENVASS
Stormwater Flow	Stormwater Management Plan	ECO Civil Consulting Engineers

1.4 PROPOSED METHOD OF ASSESSING THE ENVIRONMENTAL ASPECTS INCLUDING THE PROPOSED METHOD OF ASSESSING ALTERNATIVES

A “significant impact” is defined as it is defined in the EIA Regulations, 2014 (as amended): “an impact that may have a notable effect on one or more aspects of the environment or may result in non-compliance with accepted environmental quality standards, thresholds or targets and is determined through rating the positive and negative effects of an impact on the environment based on criteria such as duration, magnitude, intensity and probability of occurrence”. The objective of this EIA methodology is to serve as framework for accurately evaluating impacts associated with current or proposed activities in the biophysical, social, and socio-economical spheres. It aims to ensure that all legal requirements and environmental considerations are met to have a complete and integrated environmental framework for impact evaluations.

The process of determining impacts to be assessed is one of the most important parts of the environmental impact assessment process. It is of such high importance because the environmental impacts identified can and are often linked to the same impact stream. In this method all impacts on the biophysical environment are assessed in terms of the overall integrity of ecosystems, habitats, populations, and individuals affected. For example, the removal of groundcover for the

sloping or scraping of an embankment, can lead to higher amounts of water runoff which increases the rate of erosion. Further down in the river the amount of sediment increases because of the increased erosion. A number of fish species cannot endure the high amount of sediment and moves off. The habitat is thus changed or in the process of changing. Thus, one needs to understand that the root of the problem (removal of groundcover) is assessed in terms of the degree of change in the health of the environment and/or components in relation to their conservation value. If the impact of removal of groundcover of a definable system is high and the conservation value is also high, then the impact of removal of groundcover is highly significant.

Environmental Impact Assessment (EIA) Regulations, 2014 requirements [as amended]

The Environmental Impact Assessment (EIA) 2014 Regulations promulgated in terms of Sections 24 (5), 24M and 44 of the National Environmental Management Act, 1998 (Act No. 107 of 1998) [as amended] (NEMA), requires that all identified potential impacts associated with the proposed project be assessed in terms of their overall potential significance on the natural, social and economic environments. The criteria identified in the EIA Regulations, 2014 (as amended) include the following:

- Nature of the impact;
- Extent of the impact;
- Duration of the impact
- Probability of the impact occurring;
- Degree to which impact can be reversed;
- Degree to which impact may cause irreplaceable loss of resources;
- Degree to which the impact can be mitigated; and
- Cumulative impacts.

ENVASS has developed an impact assessment methodology (as defined below) whereby the Significance of a potential impact is determined through the assessment of the relevant temporal and spatial scales determined of the Extent, Magnitude and Duration criteria associated with a particular impact. This method does not explicitly define each of the criteria but rather combines them and results in an indication of the overall significance.

1.5 THE PROPOSED METHOD OF ASSESSING DURATION AND SIGNIFICANCE

The DURATION of an impact can be defined as: "*a short description of the period of time the impact will have an effect on aspects*".

Determining the duration of an impact			
	Extent	**Score**	**Description**
DURATION **Duration of the impact**	**Short term**	**1**	Less than 2 years
	Short to medium term	**2**	2 – 5 years
	Medium term	**3**	6 – 25 years
	Long term	**4**	26 – 45 years
	Permanent	**5**	46 years or more

1.5.1 Significance of Impacts

The SIGNIFICANCE can be defined as:" *the combination of the duration and importance of the impact, in terms of physical and socio-economic extent, resulting in an indicative level of mitigation required*".

The significance of an impact is determined as follows:

Significance = Irreversibility x Probability

Table 44: Significance Rating

Score	Significance	Description
0	**Neutral**	• Zero magnitude with any combination of extent and duration.
1 to 20	**Very low**	• Very low magnitude with any combination of extent and duration except regional and long term. • Low magnitude with a site-specific extent and short-term duration.
		• Very low magnitude with a site-specific extent and regional or long-term duration. • Low magnitude with any combination of extent and duration except site specific and short, regional, or long-term duration. • Medium magnitude with a site-specific extent and short-, medium- or long-term duration. • High magnitude with a site-specific extent and short-term duration.
21 to 40	**Low**	• Low magnitude with a regional extent and long-term duration. • Medium magnitude with any combination of extent and duration except site specific and short, regional or long-term duration. • High magnitude with either a local extent and short-term duration or a site-specific extent and medium-term duration. • High magnitude with a regional extent and short-term duration or a site-specific extent and long-term duration.

Score	Significance	Description
		• High magnitude with a local extent and medium-term duration.
		• Medium magnitude with a regional extent and long-term duration. • High magnitude with either a regional extent and medium-term duration or a local extent and long-term duration.
		• Medium magnitude with a national extent and long-term duration. • High magnitude with either a regional extent and long-term duration or a national extent and long-term duration. • Zero magnitude with any combination of extent and duration.
41 to 60	**Medium**	• Very low magnitude with any combination of extent and duration except regional and long term. • Low magnitude with a site-specific extent and short-term duration.
		• Very low magnitude with a site-specific extent and regional or long-term duration; • Low magnitude with any combination of extent and duration except site specific and short, regional, or long-term duration • Medium magnitude with a site-specific extent and short-, medium- or long-term duration • High magnitude with a site-specific extent and short-term duration.
		• Low magnitude with a regional extent and long-term duration. • Medium magnitude with any combination of extent and duration except site specific and short, regional, or long-term duration. • High magnitude with either a local extent and short-term duration or a site-specific extent and medium-term duration. • High magnitude with a regional extent and short-term duration or a site-specific extent and long-term duration. • High magnitude with a local extent and medium-term duration.
		• Medium magnitude with a regional extent and long-term duration. • High magnitude with either a regional extent or medium term. duration or a local extent and long-term duration.
		• Medium magnitude with a national extent and long-term duration.

Score	Significance	Description
		• High magnitude with either a regional extent and long-term duration or a national extent and long-term duration.
		• Zero magnitude with any combination of extent and duration.
61 to 80	High	• Very low magnitude with any combination of extent and duration except regional and long term. • Low magnitude with a site-specific extent and short-term duration.
		• Very low magnitude with a site-specific extent and regional or long-term duration. • Low magnitude with any combination of extent and duration except site specific and short, regional, or long-term duration • Medium magnitude with a site-specific extent and short-, medium- or long-term duration. • High magnitude with a site-specific extent and short-term duration.
		• Low magnitude with a regional extent and long-term duration. • Medium magnitude with any combination of extent and duration except site specific and short, regional, or long-term duration. • High magnitude with either a local extent and short-term duration or a site-specific extent and medium-term duration. • High magnitude with a regional extent and short-term duration or a site-specific extent and long-term duration. • High magnitude with a local extent and medium-term duration.
81 to 100	Very high	• Medium magnitude with a regional extent and long-term duration. • High magnitude with either a regional extent and medium-term duration or a local extent and long-term duration.
		• Medium magnitude with a national extent and long-term duration. • High magnitude with either a regional extent and long-term duration or a national extent and long-term duration.

1.6 THE STAGES AT WHICH THE COMPETENT AUTHORITY WILL BE CONSULTED

The competent authority will be consulted during the following stages of the application:

- With the submission of the application form;
- With the submission of a draft scoping report for comment;
- With the official submission of the scoping report;
- With the submission of a draft Environmental Impact Assessment (EIA) report for comment;
- With the official submission of the EIA report.

1.7 PARTICULARS OF THE PUBLIC PARTICIPATION PROCESS WITH REGARD TO THE IMPACT ASSESSMENT PROCESS THAT WILL BE CONDUCTED

1.7.1 Steps to be taken to notify interested and affected parties

(These steps must include the steps that will be taken to ensure consultation with the affected parties identified in (h) (ii) herein)

Public Participation is the involvement of all parties who are either potentially interested and or affected by the proposed Mareesburg Chrome Mine. The principal objective of public participation is to inform and enrich decision-making. This is also its key role in this Scoping and Environmental Impact Assessment (EIA) process.

Interested and Affected parties (I&APs) representing the following sectors of society has been identified:

- **NATIONAL DEPARTMENTS**
  - Department of Mineral Resources and Energy;
  - Department of Water and Sanitation;
  - Department Forestry, Fisheries and the Environment;
  - Department of Agriculture, Land Reform and Rural Development;

- **LIMPOPO PROVINCIAL DEPARTMENTS**
  - Department of Agriculture and Rural Development;
  - Department of Economic Development Environment and Tourism;
  - Department of Health;
  - Limpopo Department of Cooperative Governance, Human Settlements & Traditional Affairs (COGHSTA;
  - Department of Social Development;
  - Roads Agency Limpopo;
  - Limpopo Heritage Resource Authority (LIHRA).

- **LOCAL GOVERNMENT**
  - Fetakgomo Tubatse Local Municipality;

  - Sekhukhune District Municipality;
- SAHRA;
- Agriculture, including local landowners (affected and adjacent);
- Community Based Organisations;
- Non-Governmental Organisations;
- Water bodies;
- Tourism;
- Industry and mining;
- Commerce; and
- Other stakeholders.

The project will be announced as follows:

Newspaper advertisement

Publication of media advertisement (English) in the Sekhukhune Times on 12 August 2021. Proof is included in this Draft Scoping Report in Appendix 6.1.

Site notice placement

In order to inform surrounding communities, affected and adjacent landowners of the proposed development, six site notices were erected on site and at visible locations close to the site on 12 August 2021 on the same day of the newspaper advertisement placement. Proof is included in this Draft Scoping Report in Appendix 6.1.

Written notification

I&AP's and other key stakeholders, which included the above-mentioned sectors, was directly informed of the proposed development by e-mail on 12 August 2021. Proof will be included in the Final Scoping Report in Appendix 6.2.

1.7.2 Details of the engagement process to be followed

The process to be undertaken to consult interested and affected parties including public meetings and one on one consultation. NB the affected parties must be specifically consulted regardless of whether or not they attended public meetings and records of such consultation will be required in the EIA at a later stage.

The Draft Scoping Report will be made available at the following Locations:

- Samancor Chrome ECM office, Winterveld and Tweefontein Office
- Steelpoort Post Office
- Tribal Authorities Offices (Hard & Electronic Copies):

  - ✓ Phatane
  - ✓ Bengwenyama
  - ✓ Mampuru
  - ✓ Phasha
  - ✓ Malekana
  - ✓ Maphopha
  - ✓ Makua
  - ✓ Ratau
  - ✓ Maepa
  - ✓ Rantho
  - ✓ Masha Nkotwane
  - ✓ Masha Gosebo
  - ✓ Magolego
- Shaga Primary School
- Naauwpoort Lodge entrance
- Maartenshoop Police Station
- Northam/De- Brochen Main Entrance
- Booysendal - Main Entrance Gate
- Lydenburg Shoprite
- Ga – Mawela Village
- Choma Pakaneng Community
- The Mapodile Public Library and the Burgersfort Public Library;
- http://www.envass.co.za/download-documents/ (Password: #322)

I&APs will be given 30 days to comment and / or raise issues of concern regarding the proposed development. Once the commenting period expires, proof will be provided in the final scoping to be submitted to the Competent Authority.

Public and Open Day

A Public and Open day will be held at a location close and accessible to the local communities. The Applicant and the EAP will be available at this venue from 12:00 to 17:00 to answer any questions or concerns. This will ensure that any I&AP can raise any comments or concerns in person with the Applicant and EAP. Proof will be provided in the final scoping report to be submitted to the Competent Authority. *Proof of Public Open Day Records will be attached in the Final Scoping Report as Appendix 6.3*.

Virtual Public Meeting

A Virtual Public Meeting will be held in an electronic format (Zoom / Teams). The meeting will take place on the day of the Public Open Day from 17:00 – 18:00. A link to the meeting will be included to the notification sent out to I&AP's during the registration period. *Proof of Virtual Public Meeting Records will be attached in the Final Scoping Report as Appendix 6.4*.

Consultation and Correspondence with I&AP'S and Stakeholders

All I&AP registrations and comments that are received from stakeholders will be formally recorded in the Comments and Responses Report. Proof will be provided in the final scoping to be submitted to the Competent Authority.

EIA Phase of the Public Participation Process

All stakeholders and registered I&APs will have the opportunity to review and comment on all the documents released in the EIA phase. The EIA / EMPR report will be released for a period of 30 days for review and comment. During the EIA phase hardcopies and CDs of all reports and supporting documents will be submitted to the following relevant authorities:

- **NATIONAL DEPARTMENTS**
  - Department of Mineral Resources and Energy;
  - Department of Water and Sanitation;
  - Department Forestry, Fisheries and the Environment;
  - Department of Agriculture, Land Reform and Rural Development;
- **LIMPOPO PROVINCIAL DEPARTMENTS**
  - Department of Agriculture and Rural Development;
  - Department of Economic Development Environment and Tourism;
  - Department of Health;
  - Limpopo Department of Cooperative Governance, Human Settlements & Traditional Affairs (COGHSTA;
  - Department of Social Development;
  - Roads Agency Limpopo;
  - Limpopo Heritage Resource Authority (LIHRA).
- **LOCAL GOVERNMENT**
  - Fetakgomo Tubatse Local Municipality;
  - Sekhukhune District Municipality;
- SAHRA;
- Agriculture, including local landowners (affected and adjacent);
- Community Based Organisations;
- Non-Governmental Organisations;
- Water bodies;
- Tourism;

- Industry and mining;
- Commerce; and
- Other stakeholders.

All the reports will also be made available at the following Locations:

- Samancor Chrome ECM office, Winterveld and Tweefontein Office
- Steelpoort Post Office
- Tribal Authorities Offices (Hard & Electronic Copies):
    - ✓ Phatane
    - ✓ Bengwenyama
    - ✓ Mampuru
    - ✓ Phasha
    - ✓ Malekana
    - ✓ Maphopha
    - ✓ Makua
    - ✓ Ratau
    - ✓ Maepa
    - ✓ Rantho
    - ✓ Masha Nkotwane
    - ✓ Masha Gosebo
    - ✓ Magolego
- Shaga Primary School
- Naauwpoort Lodge entrance
- Maartenshoop Police Station
- Northam/De- Brochen Main Entrance
- Booysendal - Main Entrance Gate
- Lydenburg Shoprite
- Ga – Mawela Village
- Choma Pakaneng Community
- The Mapodile Public Library and the Burgersfort Public Library;
- http://www.envass.co.za/download-documents/ (Password: #322)

All stakeholders and registered I&APs will have the opportunity to review and comment on all the documents released in the EIA phase.

Public and Open Day

A Public and Open day will be held. The Applicant and the EAP will be available at the venue from 12:00 to 17:00 to answer any questions or concerns. This will ensure that any I&AP can raise any comments or concerns in person with the Applicant and EAP. Proof will be provided in the final scoping to be submitted to the Competent Authority. *I&AP's will be notified of this Public and Open day 14 days in advance. Proof will be included in the Final Scoping Report in Appendix 6.3.*

Virtual Public Meeting

A Virtual Public Meeting will be held in an electronic format (Zoom / Teams). The meeting will take place on the day of the Public Open Day from 17:00 – 18:00. A link to the meeting will be included to the notification sent out to I&AP's during the registration period. *I&AP's will be notified of this Public and Open day 14 days in advance. Proof will be included in the Final Scoping Report in Appendix 6.4.*

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

The initial 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).

- The scoping report is provided. The scoping report includes *inter alia* the site plan, a project description and typical impacts of each activity;
- The Environmental Impact Assessment Report will include *inter alia* findings of specialist studies and full assessment of all impacts of the alternatives, including cumulative impacts;
- The Environmental Management Programme to be made available, will include *inter alia* mitigation, management, and monitoring measures to prevent and mitigate negative impacts and enhance positive impacts that have been identified in the EIA; roles and responsibilities and an environmental awareness plan.

1.8 DESCRIPTION OF THE TASKS THAT WILL BE UNDERTAKEN DURING THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

1.8.1 Approach to the EIA

An Environmental Impact Assessment (EIA) is a good planning tool. It identifies the environmental impacts of a proposed development and assists in ensuring that a project will be environmentally acceptable and integrated into the surrounding environment in a sustainable way.

The EIA for this project will comply with the National Environmental Management Act (1998) (as amended) and the NEMA EIA Regulations, 2014 (as amended). The guiding principles of an EIA are listed below.

1.8.2 Guiding principles for an EIA

The EIA must take an open participatory approach throughout. This means that there should be no hidden agendas, no

restrictions on the information collected during the process and an open-door policy by the Applicant. Technical information must be communicated to stakeholders in a way that is understood by them and that enables them to meaningfully comment on the project.

There should be ongoing consultation with interested and affected parties representing all walks of life. Sufficient time for comment must be allowed. The opportunity for comment should be announced on an on-going basis. There should be opportunities for input by specialists and members of the public. Their contributions and issues should be considered when technical specialist studies are conducted and when decisions are made.

1.8.3 Information gathering

Early in the EIA process, the Environmental Assessment Practitioner (EAP) identified the information that would be required for the impact assessment and the relevant data were obtained. In addition, available information about the receiving environment was gathered from reliable sources, interested and affected parties, previous documented studies in the area and previous EIA Reports. The project team then visited the site to gain first-hand information and an understanding of the existing operations and the proposed project.

1.8.4 Specialist Assessments

Based on the impacts identified during the Scoping Phase, specialist studies have been identified to be completed and form part of the EIA. The main objective of the specialist studies is to provide independent scientifically sound information on issues of concern relating to the proposed mining operations.

The findings of the various specialist studies undertaken will be incorporated into the EIA Report. Any impacts that were not identified during the scoping phase, identified, and assessed by specialists will also be included in the environmental impact assessment phase and subsequent reports.

1.8.5 Legislative Framework

The legal requirements will be described and assessed in more detail during the EIA Phase.

1.8.6 Alternatives

Current site alternatives and layouts and additional site and layout alternatives as identified by interested and affected parties, will further be assessed and a preferred alternative recommended.

1.8.7 Description and assessment of impacts identified during the scoping phase

A comprehensive list of all impacts as identified by the EAP and the specialists, will be provided within the EIA report and assessed as per the methodology described in this report and plan of study.

1.8.8 Environmental management programme

An Environmental Management Programme containing mitigation, management and monitoring measures and specifying roles and responsibilities will be compiled with specialist input.

1.8.9 Stakeholder engagement

Registered interested and affected parties including relevant organs of state, will again be consulted with during the EIA phase. All their comments will be formally responded to and incorporated into the EIA and the EMPr report that will be submitted to the competent authority.

2 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

Table 45: Measures to avoid, reverse, mitigate or manage impacts and residual risk

ACTIVITY Whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	POTENTIAL FOR RESIDUAL RISK
CONSTRUCTION PHASE			
	A. GEOLOGY AND SOILS		
Clearing of vegetation and topsoil for the access and haul roads, extensions footprints and opencast areas. Site preparation including the access road involving clearing vegetation, excavation, and backfilling. Boundary fence, footprint preparation. Earthworks to excavate in preparation for mining and infrastructure construction. Stockpiling of topsoil and overburden for rehabilitation purposes. Loading and Hauling of topsoil and overburden to stockpiles respectively. Construction of infrastructure required including offices, workshops, ablution facilities,	Loss of topsoil High (-)	**Prevent and reduce through management measures.** • Soil stripping should be guided by the mining plan and the Samancor procedure for topsoil removal. • Stockpiles must not be located within 100 m of any recognized water course, except where authorised by the WUL. • Topsoil stripping should be performed using a dozer, loader, excavators, and trucks. • Vehicle passages should be minimised to reduce soil breakdown. • Soil that is contaminated by fuel or oil spills, for example from mining vehicles, will be collected and disposed of as hazardous waste. • Topsoil stockpiles will be restricted to less than 2.5 m in height; and • Storm water flow should be diverted around soil stockpiles.	Medium (-)
	Contamination of soils Low (-)	**Prevent and reduce and remedy through management measures.** • All vehicles and machinery will be regularly serviced to ensure they are in proper working condition and to reduce risk of leaks. • Soil that is contaminated by fuel or oil spills, for example from mining vehicles, will be collected and disposed of as hazardous waste. • The approved WUL and Integrated Water and Waste Management Plan to be implemented. ***Hydrocarbons and hazardous waste*** • All hazardous waste generated shall be kept separate and shall not be mixed with general waste. • All hazardous waste shall be appropriately stored to prevent pollution.	Low (-)
	Vehicle and personnel, as well as storage of materials, equipment and stockpiling, compaction, and degradation impacts.	**Prevent and reduce and remedy through management measures.** • Activities should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants.	Low (-)

ACTIVITY Whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	POTENTIAL FOR RESIDUAL RISK
pipelines, power lines, conveyors, processing plant, power lines. Construction of Diesel Storage Tanks. Construction of water management infrastructure (water supply dams, PCD's berms, trenches), haul roads, monitoring boreholes. Construction of access and haul roads. Dust Suppression Construction of waste rock dumps and tailings storage facilities.	Low (-)	• Compacted soils, should be deeply ripped at least to a depth of 300mm to loosen compacted layers and re-graded to even running levels.	
	Disturbance of in-situ geology Low (-)	Minimise the footprint of the mining operation and the degree of disturbance of geology and soils where possible.	Low (-)
	Disturbance of soil Low (-)	**Prevent and reduce and remedy through management measures.** • Strip all usable soil to a depth of at least 1 500 mm. • Stockpile box cut soils, and soils stripped from the mining infrastructure for later use in rehabilitation. • Implement soil conservation and management measures, as per the soils stripping and conservation plan. • Place stripped topsoil directly onto re-profiled and shaped areas to minimise the volume of soil to be stockpiled. • Stockpiles must be sited upslope from any development. • Construct storm water diversion berms for all stockpiles to protect against erosion and dirty water contamination. • Re-vegetate top soiled areas to prevent loss of soil through erosion. • Place stripped topsoil directly onto re-profiled and shaped area to minimise volume of soil that needs to be stockpiled. • Conduct soil fertility analysis prior to seeding and fertilise accordingly to create growing conditions. • Lime soils at the time of placement if necessary, to bring soil pH to a level as close to a neutral pH as possible.	Low (-)
	Reduction of viability of soils in stockpiles Medium (-)	**Prevent and reduce and remedy through management measures.** • Use containment and sealed surfaces to prevent soil contamination by fuels, oils, etc. • Clean up any areas of soil contamination. • Test areas for chemical contamination and ameliorate. • Sample soil underlying hazardous waste sites. • Cleaned areas should be free-draining and re-vegetated immediately.	Low (-)
	B. TOPOGRAPHY		
	Alteration of topography	**Prevent and reduce and remedy through management measures.**	Medium (-)

ACTIVITY Whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	POTENTIAL FOR RESIDUAL RISK
	Medium (-)	• Minimise footprint and degree of disturbance. • Blend surfaces with surrounding topography. • Backfill final voids using material in the waste rock dumps.	
	C. LAND CAPABILITY		
	Increased erosion in other areas. Low (-)	**Prevent and reduce and remedy through management measures.** • Arrange for technical assistance from developmental agribusiness specialists skilled in empowering communities, aimed at agricultural improvement to ensure benefits of compensation can be applied effectively	Medium (-)
	Reduction in land capability in other areas. Medium (-)	**Prevent and reduce and remedy through management measures.** • Implement soil conservation and management measures and replace stripped soil to a depth of 750 mm in re-profiled mined out areas. • Re-establish surface drainage and a free draining landform. • Implement soil protection and conditioning measures. • Monitor rehabilitated areas to assess performance of rehabilitation approach employed.	Medium (-)
	D. LAND USE		
	Loss of access to land High (-)	**Prevent and reduce and remedy through management measures.** • Provide monetary compensation to landowners, through the medium of a community trust. • Arrange for technical assistance from developmental agribusiness specialists skilled in empowering communities, aimed at agricultural improvement to ensure benefits of compensation can be applied effectively. • Cooperate with the Department of Land Affairs and the local tribal communities in the development of an implementation strategy and plan to ensure effective implementation of mitigation. • Replace topsoil to achieve a minimum depth of 750 mm. • Ensure soil fertility levels are appropriate for arable use.	Medium (-)
	Increased pressure on land.	**Prevent and reduce and remedy through management measures.**	Medium (-)

ACTIVITY Whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	POTENTIAL FOR RESIDUAL RISK
	Medium (-)	• Ensure the slope of rehabilitated areas are less than seven degrees to enable arable use. • Where necessary, construct stormwater control berms to prevent erosion. • Ensure soil fertility levels are appropriate for arable use.	
	E. HYDROLOGICAL AND SURFACE WATER		
	Surface water quality: Chemicals such as hydrocarbon-based fuels and oils or lubricants spilled from construction vehicles. High (-)	**Prevent and reduce and remedy through management measures.** - Construct stormwater infrastructure to be compliant with environmental legislation. - Design and manage all stormwater infrastructure to comply with the regulations. - Isolate pollution sources with roofs, concrete bases, traps, sumps and bund walls (e.g., diesel/petrol storage, wash bays and workshops). - Samancor will implement the surface water control measures in accordance with the requirements of Regulation 704. These measures must be implemented during the commencement of the construction phase. - There will be no discharges of dirty water from the mine site unless there is an extreme storm event, with the recurrence interval exceeding 1:100 years. - The operating protocol is as follows: The Crushing and screening Plant beneficiation (including dust suppression) must take water from: The Return and/or Storm water dam unless it is empty; Water from the opencast sump unless it is empty; Water from Underground. The above protocol must be strictly applied to comply with Regulation GN 704 of the National Water Act of 1998 and to minimise the water treatment and operating costs. - Samancor will avoid contamination of soils and will implement appropriate remedial measures if incidents of spillage occur. Samancor will implement responsible waste management practices. Samancor will implement all management measures pertaining to waste and water management as per the design reports.	Low (-)

ACTIVITY Whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	POTENTIAL FOR RESIDUAL RISK
		- The water balance for the project will be refined on an ongoing basis during the life of the project. Flow meters must be installed in the mine water circuit to enable refinement of the water balance. The water balance will be used to check on an on-going basis that the capacity of the dirty water holding facilities is adequate, taking the operational distribution and use of water into account. An annual report on the project water balance will be submitted to DWS. This will provide information on the status of the water balance in the wet season and the dry season and under conditions of extreme rainfall. - Clean water diversion (bunds/ canals). Good housekeeping (clean-up of spills and minimise informal storage of materials) Isolate pollution sources with roofs, concrete bases, traps, sumps and bund walls (e.g., diesel/petrol storage, wash bays and workshops). - Leak detection through inspection; Good housekeeping (maintenance of equipment); Infrastructure located within “dirty area”. - Runoff from roads will be contained. - Vehicles will be maintained at all times. - Vehicles that break down on the road or in the opencast pit will be repaired with oil drip trays placed underneath them. - In the event of 1:100-year discharge, quantities and qualities of all water that is discharged need to be monitored. - Operate the storm water dam to have 0.8 m freeboard. - Design sump with a 1:50 year holding capacity. - Implement stormwater management before land clearing start. - Install toilets with a dual flush system and showerheads that reduce water use. Re-use “wastewater” before using potable water in the beneficiation process.	
	Surface water quantity High (-)	**Prevent and reduce and remedy through management measures.** • Implement storm water management to divert clean water around the mining area. • Contour shaping of the opencast area to pre-mining topography as far as possible.	Low (-)

ACTIVITY Whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	POTENTIAL FOR RESIDUAL RISK
		• Implement rehabilitation strategy for the stream diversions. • Design all culverts and bridges with sufficient capacity. • Clean water diversions (bunds and canals) will be constructed and maintained. • Implement the selected river diversion strategy as per design document. • Monitor water quality and if good discharge to the nearest water resource. • Investigate water treatment options to treat poor quality water before discharge.	
	River characteristics High (-)	**Control through management measures.** • In compliance with the GN 704 Regulations (or the latest publication), Samancor will divert clean runoff from its mine surface infrastructure and collect dirty runoff from the sites of infrastructure. It will ensure that its storm water collection facilities and dirty water holding facilities are designed for the 1:50 year storm event and that erosion protection and appropriate energy dissipation structures will be provided at each discharge point. There will be no discharges of dirty water from the mine site unless there is an extreme storm event. • ECM must apply for a Water Use Licence from the Department of Water and Sanitation before making any changes to the drainage lines. • The reinstated drainage lines will be constructed and maintained in such a manner to prevent any erosion of the banks or bed. • A 100 m buffer zone is placed alongside the “riparian” banks of all water courses and that no mining should occur within this area. • The necessary mitigation is put in place to accommodate the storm water which would normally have been channelled and buffered by the streams flowing through the boundary and potential opencast areas. • “Riparian” habitat should be monitored for the spread of invasive or alien species and eradicated where identified. Such a monitoring plan should be implemented immediately to eliminate alien species identified before they become too problematic. This will be especially important if the flow dynamics of the streams is changed due to discharged water from the site.	Low (-)

ACTIVITY Whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	POTENTIAL FOR RESIDUAL RISK
		• As the streams are generally dry it is not suitable for SASS5 aquatic invertebrate assessment, it is thus proposed that diatom sampling be conducted (if the streams are flowing) before mining commences and as part of the monitoring plan for the mine.	
	F. GROUNDWATER		
	Deterioration of groundwater quality as a result of oil, diesel and chemical spills. Medium (-)	**Prevent and reduce and remedy through management measures.** • It must be ensured that a credible company removes used oil after vehicle servicing. • A sufficient supply of absorbent fibre should be kept at the site to contain accidental spills. • Store all potential sources in secure facilities with appropriate storm water management, ensuring contaminants are not released into the environment.	Low (-)
	Deterioration of groundwater quality during the construction phase as a result of the contamination of mine material exposed during mine construction. Medium (-)	**Prevent and reduce and remedy through management measures.** • Ensure that the appropriate design facilities (berms, storm water channels etc.) are constructed before constructing the material handling facilities and adit(s). • Implement the EMP's of other environmental related aspects, including pollution prevention and impact minimisation. • Groundwater monitoring boreholes should be sited with the aid of geophysics at designated positions based on final infrastructure layout, to comply with the design requirements of a groundwater monitoring system, as recommended. • Groundwater monitoring boreholes should be installed to comply with the minimum requirements as set by governmental guidelines.	
	G. TERRESTRIAL BIODIVERSITY (FAUNA AND FLORA)		
	Potential decrease in biodiversity on the study and surrounding area. Low (-)	**Reduce through management measures.** • Only vegetation falling directly in demarcated mining areas should be removed for topsoil to be removed. • No further vegetation clearance except for the removal of alien invasive species will be allowed. • Protect trees not directly affected by the opencast area.	Low (-)

ACTIVITY Whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	POTENTIAL FOR RESIDUAL RISK
		• Develop a management plan for immediate clean-up in case of pollution incidents at streams, rivers and drainage crossings. • Fire breaks should be constructed and maintained along the inside of the blast exclusion zone. • Do not clear vegetation on the hills within the blasting safety zone. • Do not allow mine personnel, or appointed contract staff, to harvest any indigenous vegetation from the hillside areas. • Avoid unnecessary clearance of indigenous vegetation, such as trees in non-mining areas within the exclusion zone. • Maintain the blast zone free of exotic vegetation. • Following soil placement during rehabilitation, all top soiled areas should be seeded to encourage vegetation establishment.	
	Establishment of alien invasive species Medium (-)	**Prevent and control through management measures.** • An alien vegetation management plan should be compiled and implemented. • Regular removal of invasive alien species should be undertaken. This should extend right through to the closure phase of the project.	Low (-)
	Impact on natural local migratory routes and faunal dispersal patterns. Medium (-)	**Reduce and control through management measures.** • Reduce the levels of disturbance on areas indicated as migratory routes, if any.	Medium (-)
	Disturbance and loss of fauna through noise, light and dust pollution and hunting, trapping, and killing of fauna. Medium (-)	**Reduce through controlling measures.** • Educate mine personnel on conservation and ecological significance of site fauna and flora and habitats. • Any animals rescued or recovered will be relocated in a suitable habitat away from the mining operations and associated infrastructure. • Any lizards, snakes or monitors encountered should be allowed to escape to suitable habitat away from disturbance. • No reptile should be intentionally killed, caught, or collected during any phase of the project.	Low (-)
	H. AQUATIC BIODIVERSITY		
	Damage to aquatic ecosystems Low (-)	**Reduce through controlling management measures.** • The appropriate seed mixture should be used. • Do not use pioneering rhizomatous grasses (kweek / couch grass).	Low (-)

ACTIVITY Whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	POTENTIAL FOR RESIDUAL RISK
		• Protect all-natural elements such as trees and rocky outcrops since they provide shelter for a variety of animals and reptiles. • No hunting or trapping should be allowed on the site or in the rocky outcrop and hill areas.	
	I. VISUAL		
	Visibility from sensitive receptors / visual scarring of the landscape as a result of the construction activities. Medium (-)	**Reduce through controlling management measures.** • Housekeeping on site should be enforced. • Minimising the size and height of buildings and structures. • Paint buildings and structures in colours to match the surroundings. • Constructing screening berms from receptors, rehabilitate disturbed areas as soon as practical to match the surrounding land use. • Manage trees in the screening barrier to ensure that, as the trees grow in size and the screening benefit of the tree barrier is not lost through the back.	Low (-)
	Added impact of security lighting on surrounding landowners and nocturnal animals. Medium (-)	**Reduce through controlling measures.** • Unnecessary lights should be switched off during the day and / or night to avoid light pollution. • If lighting is required, the lighting will be located in such a place and such a manner so as to minimise any impact on the surrounding community (directional lighting).	Low (-)
	J. NOISE AND VIBRATION		
	Nuisance and health risks caused by an increase in the ambient noise level as a result of noise impacts associated with the operation of construction vehicles, EMV's and equipment. Medium (-)	**Reduce through controlling measures.** • Vehicles will be regularly serviced to ensure acceptable noise levels are not exceeded. Silencers will be utilised where possible. • Noise levels should be kept within acceptable limits. • With regard to unavoidable very noisy activities in the vicinity of noise sensitive areas, the Site Manager (SM) should liaise with local residents and how best to minimise impacts, and the local population should be kept informed of the nature and duration of intended activities. • Personal Protective Equipment to all persons working in areas where high levels of noise can be expected; Signs where it is compulsory must be displayed. • Regular inspections and maintenance of equipment, vehicles and machinery to prevent unnecessary noise.	Medium (-)
	Vibration due to construction activities.	**Reduce through controlling measures.**	Low (-)

ACTIVITY Whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	POTENTIAL FOR RESIDUAL RISK
	Low (-)	• Implement safety measures when blasting, e.g. notification of blast times, temporarily interrupt traffic flows, patrol area, carry out blast, inspect road surface and remove material from road, reinstate traffic.	
	K. AIR QUALITY		
	Windborne dust (soil) and vehicle fumes altering air quality. Medium (-)	**Reduce through controlling measures.** • Dust suppression shall be implemented. • Suppress dust at the crusher and run of mine tip by means of dust suppression sprays. • Minimise the areas of exposed soils. • Damp down prior to blasting. • Utilise correct blast design to minimise dust. • Compact and rehabilitate land surfaces as soon as practical and vegetate if appropriate. • Ensure that shortest routes are used for material transport. • Ensure that stockpile height is kept to a minimum. • Keep to site speed limits. • Implement and actively monitor dust fallout generated on the borders of the site.	Low (-)
	L. SOCIO ECONOMIC		
	Construction cost to Samancor. Medium (-)	**Prevent and reduce through management measures.** • Assist communities to develop a community development strategy to address the potential impact of the mining in the area.	Medium (-)
	Strengthening of regional and local economy due to the income and knock-on opportunities. Medium (+)	• Establish, and communicate qualification criteria for, a bursary scheme for community members to focus on core mining skills. • Mentor empowerment groups. • Implement employment equity.	Medium (+)
	Restricted access to land and other destinations (obstruction). Medium (-)	**Prevent and reduce through management measures.** • Improved pedestrian access should be considered if any of the roads comprising the haulage route are upgraded.	Medium (-)

ACTIVITY Whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	POTENTIAL FOR RESIDUAL RISK
	Increased pressure on water supply and sanitation as a result of inward migration. Low (-)	**Prevent and reduce through management measures.** • Assist community chiefs and representatives to develop a strategy to limit and manage possible inward migration and population growth (Samancor Chrome). • Provide additional formal water supply infrastructure to affected communities. • Provide technical training to selected community members to allow them to operate boreholes and pumps effectively and to fix them when in need of repair (Samancor Chrome).	Low (-)
	Increase in sexually transmitted disease and HIV/AIDS as a result of inward migration. Medium (-)	**Prevent and reduce through management measures.** • Assist community chiefs and representatives to develop a strategy to limit and manage possible inward migration and population.	Medium (-)
	Increase in water-borne diseases, as a result of inward migration and increased pressure on water supply and sanitation. High (-)	**Prevent and reduce through management measures**. • Advertise and disseminate information regarding the low employment prospects at the mine, to minimise inward migration and pressure on supplies (Samancor Chrome).	Medium (-)
	Reduction in nutrition and food security as a result of loss of access to subsistence agricultural land. Medium (-)	**Prevent and reduce through management measures.** • Provide monetary compensation to landowners to provide for purchase of food, through the medium of a community trust.	Medium (-)
	Poorer health care as a result of inward migration and increased pressure on medical resources. Medium (-)	**Prevent through management measures.** • Cooperate with the Department of Land Affairs in the development of an implementation strategy and plan to ensure effective implementation of mitigation, especially monetary compensation and technical training.	Medium (-)
	Increase in road safety risks due to increased road traffic. Medium (-)	**Prevent and reduce through management measures.** • Enforce good driving standards. • Communicate to the communities the nature of existing groundwater quality issues with respect to nitrate and discuss possible measures to address the problem.	Medium (-)

ACTIVITY Whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	POTENTIAL FOR RESIDUAL RISK
		• Make alternative water supplies available to affected communities if monitoring shows a significant increase in nitrate concentrations. • Provide additional medical facilities to affected communities (government or aid agency). • Assist in the promotion of a health education campaign, covering water and sanitation.	
	Increase in noise and vibration.	Refer to noise and vibration aspects.	
	Reduction in sense of place.	Refer to visual aspects.	
	M. ARCHAEOLOGY AND PALAEONTOLOGY		
	Destruction of or damage to archaeological remains and loss of information. High (-)	**Prevent through management measures**. • Avoid disturbance of archaeological remains, graves and human remains as far as possible. • Demarcate and protect sites within the exclusion zone that need not be directly disturbed. • Undertake archaeological investigations of the remains prior regulatory requirements. • Immediately report any finds during mine development and operation, and avoid disturbance until they are examined by regulatory authorities.	Medium (-)
	Disturbance of graves and human remains. High (-)	**Prevent through management measures**. • Avoid disturbance of archaeological remains, graves and human remains as far as possible. • Demarcate and protect sites within the exclusion zone that need not be directly disturbed. • Undertake archaeological investigations of the remains prior regulatory requirements. • Immediately report any finds during mine development and operation, and avoid disturbance until they are examined by regulatory authorities.	Medium (-)
	N. TRAFFIC		
	Increase in vehicle movement to and from the mine as a result of the Mareesburg Chrome Mine.	**Prevent and reduce through management measures.** • Enforce good driving standards.	Low (-)

ACTIVITY Whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	POTENTIAL FOR RESIDUAL RISK
	Low (-)		
	O. WASTE		
	Generation of additional general waste, litter, building rubble and hazardous material during the construction activities. Medium (-)	**Prevent and reduce through management measures.** • Ensure that non-hazardous and hazardous substances are appropriately identified, collected and disposed of. • All general and non-mining waste must be regularly removed to an authorised waste management facility. • The burning of waste is prohibited.	Low (-)
OPERATIONAL PHASE			
Clearing of vegetation and topsoil by bulldozer / frontend loader during opencast mining. Stockpiling of topsoil and overburden for later rehabilitation Opencast mining using heavy duty earth moving equipment Blasting Stockpiling of ROM Loading, hauling and transport by truck of ROM to stockpiles and processing plant. Crushing, screening and washing of ROM.	**A. GEOLOGY AND SOIL**		
	Loss of topsoil during stripping, stockpiling, handling and placement on rehabilitated areas. Medium (-)	**Prevent and reduce through management measures.** • Soil stripping should be guided by the mining plan and the Samancor procedure for topsoil removal. • Stockpiles must not be located within 100 m of any recognized water course. • Topsoil stripping should be performed using a dozer, loader, excavators, and trucks. • Vehicle passages should be minimised to reduce soil breakdown. • Soil that is contaminated by fuel or oil spills, for example from mining vehicles, will be collected and disposed of as hazardous waste. • Topsoil stockpiles will be restricted to the minimum height required. • Storm water flow should be diverted around soil stockpiles.	Low (-)
	Contamination of soils Medium (-)	**Prevent and reduce and remedy through management measures.** • All vehicles and machinery will be regularly serviced to ensure they are in proper working condition and to reduce risk of leaks. • Soil that is contaminated by fuel or oil spills, for example from mining vehicles, will be collected and disposed of as hazardous waste. • The approved WUL and Integrated Water and Waste Management Plan to be implemented. ***Hydrocarbons and hazardous waste*** • All hazardous waste generated shall be kept separate and shall not be mixed with general waste. • All hazardous waste shall be appropriately stored to prevent pollution.	Low (-)

ACTIVITY Whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	POTENTIAL FOR RESIDUAL RISK
Deposition of waste rock onto waste rock dump Disposal of Tailings to RSF Maintenance of PCD and other stormwater infrastructure Dust suppression	Vehicle and personnel, as well as storage of materials, equipment and stockpiling, compaction, and degradation impacts. Low (-)	**Prevent and reduce and remedy through management measures.** • Activities should be limited to area of disturbance. • Compacted soils, should be deeply ripped at least to a depth of 300mm to loosen compacted layers and re-graded to even running levels.	Low (-)
	Disturbance of in-situ geology. Medium (-)	Minimise the footprint of the mining operation and the degree of disturbance of geology and soils where possible.	Medium (-)
	Disturbance of soil. Low (-)	**Prevent and reduce and remedy through management measures.** • Strip all usable soil to a depth of at least 1 500 mm. • Stockpile box cut soils, and soils stripped from the mining infrastructure for later use in rehabilitation. • Implement soil conservation and management measures, as per the soils stripping and conservation plan. • Stockpiles must be sited upslope from any development. • Re-vegetate top soiled areas to prevent loss of soil through erosion. • Conduct soil fertility analysis prior to seeding and fertilise accordingly to create growing conditions. • Lime soils at the time of placement if necessary to bring soil pH to a level as close to a neutral pH as possible.	Low (-)
	Reduction of viability of soils in stockpiles. Medium (-)	**Prevent and reduce and remedy through management measures.** • Use containment and sealed surfaces to prevent soil contamination by fuels, oils, etc. • Clean up any areas of soil contamination. • Test areas for chemical contamination and ameliorate. • Sample soil underlying hazardous waste sites. • Cleaned areas should be free-draining and re-vegetated immediately	Low (-)
	B. TOPOGRAPHY		
	Alteration of topography. Low (-)	**Prevent and reduce and remedy through management measures.** • Minimise footprint and degree of disturbance. • Blend surfaces with surrounding topography. • Backfill final voids using material in the waste rock dumps.	Medium (-)
	C. LAND CAPABILITY		

ACTIVITY Whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	POTENTIAL FOR RESIDUAL RISK
	Increased erosion in other areas. Medium (-)	**Prevent and reduce and remedy through management measures.** Arrange for technical assistance from developmental agribusiness specialists skilled in empowering communities, aimed at agricultural improvement to ensure benefits of compensation can be applied effectively	Medium (-)
	Reduction in land capability in other areas. Medium (-)	**Prevent and reduce and remedy through management measures.** • Implement soil conservation and management measures, and replace stripped soil to a depth of 750 mm in re-profiled mined out areas. • Re-establish surface drainage and a free draining landform. • Implement soil protection and conditioning measures. • Monitor rehabilitated areas to assess performance of rehabilitation approach employed.	Medium (-)
	D. LAND USE		
	Loss of access to land. High (-)	**Prevent and reduce and remedy through management measures.** • Provide monetary compensation to landowners, through the medium of a community trust. • Arrange for technical assistance from developmental agribusiness specialists skilled in empowering communities, aimed at agricultural improvement to ensure benefits of compensation can be applied effectively. • Cooperate with the Department of Land Affairs and the local tribal communities in the development of an implementation strategy and plan to ensure effective implementation of mitigation. • Replace topsoil to achieve a minimum depth of 750 mm. • Ensure soil fertility levels are appropriate for arable use.	Medium (-)
	Increased pressure on land. Low (-)	**Prevent and reduce and remedy through management measures.** • Ensure the slope of rehabilitated areas are less than seven degrees to enable arable use. • Where necessary, construct storm water control berms to prevent erosion. • Ensure soil fertility levels are appropriate for arable use.	Medium (-)
	E. HYDROLOGICAL AND SURFACE WATER		
	Surface water quality:	**Prevent and reduce and remedy through management measures.** - Manage all stormwater infrastructure to comply with the regulations.	Low (-)

ACTIVITY Whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	POTENTIAL FOR RESIDUAL RISK
	Chemicals such as hydrocarbon-based fuels and oils or lubricants spilled from vehicles. Medium (-)	- Maintain roofs, concrete bases, traps, sumps and bund walls (e.g. diesel/petrol storage, wash bays and workshops). - Samancor will maintain the surface water control measures in accordance with the requirements of Regulation 704. These measures must be implemented during all phases. - There will be no discharges of dirty water from the mine site unless there is an extreme storm event, with the recurrence interval exceeding 1:100 years. - The operating protocol is as follows: The Crushing and screening Plant beneficiation (including dust suppression) must take water from: The Return and/or Storm water dam unless it is empty; Water from the opencast sump unless it is empty; Water from Underground. The above protocol must be strictly applied to comply with Regulation GN 704 of the National Water Act of 1998 and to minimise the water treatment and operating costs. - Samancor will avoid contamination of soils and will implement appropriate remedial measures if incidents of spillage occur. Samancor will implement responsible waste management practices. Samancor will implement all management measures pertaining to waste and water management as per the design reports. - The water balance for the project will be refined on an ongoing basis during the life of the project. Flow meters must be installed in the mine water circuit to enable refinement of the water balance. The water balance will be used to check on an on-going basis that the capacity of the dirty water holding facilities is adequate, taking the operational distribution and use of water into account. An annual report on the project water balance will be submitted to DWS. This will provide information on the status of the water balance in the wet season and the dry season and under conditions of extreme rainfall. - Clean water diversion (bunds/ canals). Good housekeeping (clean-up of spills and minimise informal storage of materials) Isolate pollution	

ACTIVITY Whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	POTENTIAL FOR RESIDUAL RISK
		sources with roofs, concrete bases, traps, sumps and bund walls (e.g. diesel/petrol storage, wash bays and workshops). - Leak detection through inspection; Good housekeeping (maintenance of equipment); Infrastructure located within "dirty area". - Runoff from roads will be contained. - Vehicles will be maintained at all times. - Vehicles that break down on the road or in the opencast pit will be repaired with oil drip trays placed underneath them. - In the event of 1:100-year discharge, quantities and qualities of all water that is discharged need to be monitored. - Operate the storm water dam to have 0.8 m freeboard. - Design sump with a 1:50-year holding capacity. - Implement stormwater management before land clearing start.	
	Surface water quantity. High (-)	**Prevent and reduce and remedy through management measures.** • Implement and maintain storm water management to divert clean water around the mining area. • Contour shaping of the opencast area to pre-mining topography as far as possible. • Implement rehabilitation strategy for the stream diversions. • Design all culverts and bridges with sufficient capacity. • Clean water diversions (bunds and canals) will be constructed and maintained. • Implement the selected river diversion strategy as per design document. • Monitor water quality and if good discharge to the nearest water resource. • Investigate water treatment options to treat poor quality water before discharge	Low (-)
	River Characteristics (Beds, Banks, Course) High (-)	**Control through management measures.** • In compliance with the GN 704 Regulations (or the latest publication), Samancor will divert clean runoff from its mine surface infrastructure and collect dirty runoff from the sites of infrastructure. It will ensure that its storm water collection facilities and dirty water holding facilities are designed for the 1:50 year storm event and that erosion protection and appropriate energy dissipation structures will be provided at each discharge point. There will be no discharges of dirty water from the mine site unless there is an extreme storm event.	Low (-)

ACTIVITY Whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	POTENTIAL FOR RESIDUAL RISK
		• ECM must apply for a Water Use Licence from the Department of Water and Sanitation before making any changes to the drainage lines. • The reinstated drainage lines will be constructed and maintained in such a manner to prevent any erosion of the banks or bed. • A 100 m buffer zone is placed alongside the "riparian" banks of all water courses and that no mining should occur within this area. • The necessary mitigation is put in place to accommodate the storm water which would normally have been channelled and buffered by the streams flowing through the boundary and potential opencast areas. • "Riparian" habitat should be monitored for the spread of invasive or alien species and eradicated where identified. Such a monitoring plan should be implemented immediately to eliminate alien species identify before they become too problematic. This will be especially important if the flow dynamics of the streams is changed due to discharged water from the site. • As the streams are generally dry it is not suitable for SASS5 aquatic invertebrate assessment, it is thus proposed that diatom sampling be conducted (if the streams are flowing) before mining commences and as part of the monitoring plan for the mine.	
	F. GROUNDWATER		
	Groundwater quantity-lowering of groundwater table and impact on water supply of groundwater table and impact on water supply of groundwater users. Medium (-)	**Mitigate through management measures.** • Monitor static groundwater levels on a quarterly basis in all boreholes within a zone of one to two kilometres surrounding the opencasts to ensure that any deviation of the groundwater flow from the idealised predictions is detected in time and can be reacted on appropriately. • If it can be proven that the mining operation is indeed affecting the quantity of groundwater available to certain users, the affected parties should be compensated. This may be done through the installation of additional boreholes for water supply purposes, or an alternative water supply. • The numerical model should be updated during mining by using the measured water ingress, water levels, mining geophysics information to re-calibrate and refine the impact prediction.	Medium (-)

ACTIVITY Whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	POTENTIAL FOR RESIDUAL RISK
	Groundwater quality – Contamination of groundwater and deterioration of quality down gradient of the mining operations. High (-)	**Manage and mitigate through management measures.** • Mine sections should be sealed where possible during mining to reduce the contact of water and air with remaining sulphides. • All potential sources of pollution, such as tailings and pollution control dams should be lined to prevent ingress of contamination into the groundwater system. • Install water collection and pumping systems within the mining areas capable of rapidly pumping water out, so minimising contact of water with the geochemically reactive material. • Clean and dirty water systems should be separated. • Groundwater quality must be monitored on a quarterly basis. • Numerical groundwater model must be updated by calibrating the model with monitoring data. • Implement as many closure measures during the operational phase, while conducting appropriate monitoring programmes to demonstrate actual performance of the various management actions during the life of mine.	Medium (-)
	Groundwater quality – Contamination of groundwater and deterioration of quality as a result of oil, diesel and chemical spills/leaks from machinery and storage facilities. Medium (-)	**Manage and mitigate though management measures.** • It must be ensured that a credible company removes used oil after vehicle servicing. • A sufficient supply of absorbent fibre should be kept at the site to contain accidental spills. • Store all potential sources in secure facilities with appropriate stormwater management, ensuring contaminants are not released into the environment.	Low (-)
	Groundwater quality – Contamination of groundwater and deterioration of quality as a result of sewage related contamination. Medium (-)	**Prevent through management measures.** • Sewage effluent emanating from latrines or ablution blocks should be treated to acceptable levels before discharge into the environment.	Low (-)
	G. TERRESTRIAL BIODIVERSITY (FAUNA AND FLORA)		

ACTIVITY Whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	POTENTIAL FOR RESIDUAL RISK
	Potential decrease in biodiversity on the study and surrounding area. High (-)	**Reduce through management measures.** • Only vegetation falling directly in demarcated mining areas should be removed for topsoil to be removed. • No further vegetation clearance except for the removal of alien invasive species will be allowed. • Protect trees not directly affected by the opencast area. • Develop a management plan for immediate clean-up in case of pollution incidents at streams, rivers and drainage crossings. • Fire breaks should be constructed and maintained along the inside of the blast exclusion zone. • Do not clear vegetation on the hills within the blasting safety zone. • Do not allow mine personnel, or appointed contract staff, to harvest any indigenous vegetation from the hillside areas. • Avoid unnecessary clearance of indigenous vegetation, such as trees in non-mining areas within the exclusion zone. • Maintain the blast zone free of exotic vegetation. • Following soil placement during rehabilitation, all top soiled areas should be seeded to encourage vegetation establishment.	Low (-)
	Establishment of alien invasive species Medium (-)	**Prevent and control through management measures.** • An alien vegetation management plan should be compiled and implemented. • Regular removal of invasive alien species should be undertaken. This should extend right through to the closure phase of the project.	Low (-)
	Impact on natural local migratory routes and faunal dispersal patterns. Medium (-)	**Reduce and control through management measures.** Reduce the levels of disturbance on areas indicated as migratory routes, if any.	Medium (-)
	Disturbance and loss of fauna through noise, light and dust pollution and hunting, trapping and killing of fauna. Medium (-)	**Reduce through controlling measures.** • Educate mine personnel on conservation and ecological significance of site fauna and flora and habitats. • Any animals rescued or recovered will be relocated in a suitable habitat away from the mining operations and associated infrastructure. • Any lizards, snakes or monitors encountered should be allowed to escape to suitable habitat away from disturbance.	Very Low (-)

ACTIVITY Whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	POTENTIAL FOR RESIDUAL RISK
		• No reptile should be intentionally killed, caught or collected during any phase of the project.	
	H. AQUATIC BIODIVERSITY		
	Damage to aquatic ecosystems. High (-)	**Reduce through controlling management measures.** • The appropriate seed mixture should be used during rehabilitation. • Do not use pioneering rhizomatous grasses (kweek / couch grass). • Protect all-natural elements such as trees and rocky outcrops since they provide shelter for a variety of animals and reptiles. • No hunting or trapping should be allowed on the site or in the rocky outcrop and hill areas.	Low (-)
	I. VISUAL AND LIGHTING		
	Visibility from sensitive receptors / visual scarring of the landscape as a result of the construction activities. Medium (-)	**Reduce through controlling management measures.** • Housekeeping on site should be enforced. • Manage trees in the screening barrier to ensure that, as the trees grow in size and the screening benefit of the tree barrier is not lost through the back.	Low (-)
	Added impact of security lighting on surrounding landowners and nocturnal animals. Medium (-)	**Reduce through controlling measures.** • Unnecessary lights should be switched off during the day and / or night to avoid light pollution. • If lighting is required, the lighting will be located in such a place and such a manner so as to minimise any impact on the surrounding community.	Low (-)
	J. NOISE AND VIBRATION		
	Nuisance and health risks caused by an increase in the ambient noise level as a result of noise impacts associated with the operation of vehicles, EMV's and equipment, as well as production activities. Medium (-)	**Reduce through controlling measures.** • Vehicles will be regularly serviced to ensure acceptable noise levels are not exceeded. Silencers will be utilised where possible. • Noise levels should be kept within acceptable limits. • With regard to unavoidable very noisy activities in the vicinity of noise sensitive areas, the Site Manager (SM) should liaise with local residents and how best to minimise impacts, and the local population should be kept informed of the nature and duration of intended activities. • Personal Protective Equipment to all persons working in areas where high levels of noise can be expected; Signs where it is compulsory must be displayed.	Medium (-)

ACTIVITY Whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	POTENTIAL FOR RESIDUAL RISK
		• Regular inspections and maintenance of equipment, vehicles and machinery to prevent unnecessary noise.	
	Noise and vibration due to blasting. High (-)	**Reduce through controlling measures.** • Implement additional safety measures when blasting, e.g. notification of blast times, temporarily interrupt traffic flows, patrol area, carry out blast, inspect road surface and remove material from road, reinstate traffic.	Medium (-)
	K. AIR QUALITY		
	Windborne dust (soil) and vehicle fumes altering air quality. Medium (-)	**Reduce through controlling measures.** • Dust suppression shall be implemented. • Suppress dust at the crusher and run of mine tip by means of dust suppression sprays. • Minimise the areas of exposed soils. • Damp down prior to blasting. • Utilise correct blast design to minimise dust. • Compact and rehabilitate land surfaces as soon as practical and vegetate if appropriate. • Ensure that shortest routes are used for material transport. • Ensure that stockpile height is kept to a minimum. • Keep to site speed limits. • Implement and actively monitor dust fallout generated on the borders of the site. • Implement monthly site inspection to check for possible areas of dust generation not addressed or not effectively managed.	Low (-)
	Increased windborne dust from open unrehabilitated areas. Medium (-)		Low (-)
	L. SOCIO ECONOMIC		
	Extended employment provision due to the implementation of the activities, allowing mining activities to continue for additional years. High (+)	N/A	
	Continued sourcing supplies from local residents and businesses boosting the local economy for an extended period of time.	N/A	

ACTIVITY Whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	POTENTIAL FOR RESIDUAL RISK
	Medium (+)		
	Operating cost to Samancor Medium (-)	**Prevent and reduce through management measures.** Assist communities to develop a community development strategy to address the potential impact of the mining in the area.	Medium (-)
	Strengthening of regional and local economy due to the income and knock-on opportunities. Medium (+)	• Establish, and communicate qualification criteria for, a bursary scheme for community members to focus on core mining skills. • Mentor empowerment groups. • Implement employment equity.	Medium (+)
	Increased pressure on water supply and sanitation as a result of inward migration. Medium (-)	**Prevent and reduce through management measures.** • Assist community chiefs and representatives to develop a strategy to limit and manage possible inward migration and population growth (Samancor Chrome). • Provide additional formal water supply infrastructure to affected communities. • Provide formal sanitation or semi-permanent sanitation facilities to affected communities (Government or aid agency). • Provide technical training to selected community members to allow them to operate boreholes and pumps effectively and to fix them when in need of repair.	Medium (-)
	Increase in methemoglobinemia due to possible increased nitrate in boreholes. Medium (-)		Low (-)
	Increase in water-borne diseases, as a result of inward migration and increased pressure on water supply and sanitation. Medium (-)	**Prevent and reduce through management measures**. Advertise and disseminate information regarding the low employment prospects at the mine, to minimise inward migration and pressure on supplies.	Medium (-)
	Reduction in nutrition and food security as a result of loss of access to subsistence agricultural land. High (-)	**Prevent and reduce through management measures.** Provide monetary compensation to landowners to provide for purchase of food, through the medium of a community trust.	Medium (-)

ACTIVITY Whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	POTENTIAL FOR RESIDUAL RISK
	Poorer health care as a result of inward migration and increased pressure on medical resources. Medium (-)	**Prevent through management measures.** Cooperate with the Department of Land Affairs in the development of an implementation strategy and plan to ensure effective implementation of mitigation, especially monetary compensation and technical training.	Medium (-)
	Increase in sexually transmitted disease and HIV/AIDS as a result of inward migration. Medium (-)	**Prevent and reduce through management measures.** Assist community chiefs and representatives to develop a strategy to limit and manage possible inward migration and population.	Medium (-)
	Increase in noise and vibration.	Refer to noise and vibration aspects.	
	Increase in traffic.	Refer to traffic aspects.	
	Reduction in sense of place.	Refer to visual aspects.	
	M. ARCHAEOLOGY AND PALAEONTOLOGY		
	No additional Impact	**Prevent through management measures.** • Avoid disturbance of archaeological remains, graves and human remains as far as possible. • Demarcate and protect sites within the exclusion zone that need not be directly disturbed. • Undertake archaeological investigations of the remains prior regulatory requirements. • Immediately report any finds during mine development and operation, and avoid disturbance until they are examined by regulatory authorities.	N/A
	N. TRAFFIC		
	The change in traffic patterns as a result of traffic entering and exiting the site on the surrounding road infrastructure and existing traffic.	**Reduce through controlling management measures.** Heavy vehicles should adhere to the speed limit of the road.	Very Low (-)

ACTIVITY Whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	POTENTIAL FOR RESIDUAL RISK
	Low (-)		
	O. WASTE		
	Generation of additional general waste, litter and building rubble and hazardous material during the operational phase. Medium (-)	**Control through management measures.** • The conditions of the Integrated Water Use License (IWUL) and the IWWMP must be implemented. • The central waste storage and transition area shall be surfaced and demarcated appropriately; • Appropriate waste management system must be kept in place to ensure separation of hazardous water, and appropriate storage and disposal. • Wherever possible and practical, waste materials generated on site must be recycled.	Low (-)
REHABILITATION, CLOSURE AND POST CLOSURE PHASE			
Backfilling and landscaping Topsoil placement and reseeding concurrent rehabilitation Monitoring of rehabilitated areas	**A. GEOLOGY AND SOILS**		
	Contamination of soils Medium (-)	**Prevent and reduce and remedy through management measures.** • All vehicles and machinery will be regularly serviced to ensure they are in proper working condition and to reduce risk of leaks. • Soil that is contaminated by fuel or oil spills, for example from mining vehicles, will be collected and disposed of as hazardous waste. • The approved Rehabilitation Plan to be implemented. ***Hydrocarbons and hazardous waste*** • All hazardous waste generated shall be kept separate and shall not be mixed with general waste. • All hazardous waste shall be appropriately stored to prevent pollution.	Low (-)
	Vehicle and personnel, as well as storage of materials, equipment and stockpiling, compaction and degradation impacts. Medium (-)	**Prevent and reduce and remedy through management measures.** • Activities should be limited to the area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. • Compacted soils, should be deeply ripped at least to a depth of 300mm to loosen compacted layers and re-graded to even running levels.	Low (-)
	Disturbance of in-situ geology. Medium (-)	**Prevent and reduce and remedy through management measures.** • Minimise the footprint of the rehabilitation activities and degree of disturbance of geology and soils where possible.	Medium (-)
	Mixing and dilution of soils.	**Prevent and reduce and remedy through management measures.** • Cleaned areas should be free-draining and re-vegetated immediately	Low (-)

ACTIVITY Whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	POTENTIAL FOR RESIDUAL RISK
	Medium (-)		
	Erosion of replaced soils Medium (-)	**Prevent and reduce and remedy through management measures.** • Put measures in place to prevent erosion and subsequent siltation. • Drainage channels, where applicable shall be established to minimise erosion	Medium (-)
	Reduction of viability of replaced soils. Medium (-)	**Prevent and reduce and remedy through management measures.** • Use containment and sealed surfaces to prevent soil contamination by fuels, oils, etc. • Clean up any areas of soil contamination. • Test areas for chemical contamination and ameliorate. • Sample soil underlying hazardous waste sites. • Cleaned areas should be free-draining and re-vegetated immediately	Low (-)
	B. TOPOGRAPHY		
	Alteration of topography. Medium (-)	**Prevent and reduce and remedy through management measures.** • Minimise footprint and degree of disturbance. • Backfill final voids using material in the waste rock dumps. • Deplete and clear the chromite stockpiles at the completion of mining. • Blend rehabilitated surfaces with surrounding topography. • Remove fixed infrastructure at the Mareesburg Chrome Mine site. Service infrastructure will be removed on cessation of mining. • Mine residue deposits will be vegetated and inspected annually. Storm water infrastructure around waste deposits will be maintained and inspected annually. • Underground working adits will be sealed. • Rehabilitation of the opencast mined areas on site will follow the mining cut and be completed within the operational phase of the project. Box cut spoils will be used to close the final void. The entire mined pit area will be in filled and covered with usable soil and returned to agricultural use. • With the exception of the mine residue sites it is not anticipated that any post mining maintenance on the established vegetation community will be necessary because the land will return to community use as subsistence agricultural land. The tufted grass community established	Medium (-)

ACTIVITY Whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	POTENTIAL FOR RESIDUAL RISK
		during rehabilitation to stabilise the site and limit soil erosion from site is likely to be ploughed up by the community, on return of the land, in preparation of planting of food crops. • With regards to the opencast pit area, it is not anticipated that significant or large scale surface subsidence will occur associated with the opencast mined block because the spoils will be deposited by truck and the spoil areas will grow incrementally. Some minor and localised settlement may occur. However, the pit is located on a very gentle ponding of water. Should localised small depressions form, they will be in filled with useable soil and the disturbed area re-vegetated.	
	C. LAND CAPABILITY		
	Reduction in land capability when available once more. Low (-)	**Prevent and reduce and remedy through management measures.** • Implement soil conservation and management measures, and replace stripped soil to a depth of 750 mm in re-profiled mined out areas. • Re-establish surface drainage and a free draining land form. • Implement soil protection and conditioning measures. • Monitor rehabilitated areas annually to assess performance of rehabilitation approach employed in order to identify: – Occurrence of surface erosion; – Vegetation die back; – To establish whether salinization of soil is occurring; – Fertility status of rehabilitated land; and – The emergence of alien / exotic vegetation.	Low (-)
	D. LAND USE		
	Loss of access to land. High (-)	**Prevent and reduce and remedy through management measures.** • Provide monetary compensation to landowners, through the medium of a community trust. • Arrange for technical assistance from developmental agribusiness specialists skilled in empowering communities, aimed at agricultural improvement to ensure benefits of compensation can be applied effectively.	Medium (-)

ACTIVITY Whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	POTENTIAL FOR RESIDUAL RISK
		• Cooperate with the Department of Land Affairs and the local tribal communities in the development of an implementation strategy and plan to ensure effective implementation of mitigation. • Replace topsoil to achieve a minimum depth of 750 mm. • Ensure soil fertility levels are appropriate for arable use.	
	E. SURFACE WATER AND HYDROLOGY		
	Contamination of stormwater runoff and ground water, caused by potential hydrocarbon spills. Medium (-)	**Prevent and reduce through management measures.** • All temporary storm water infrastructure (if any) on-site shall be maintained and kept clean. • Internal reporting incidents of any polluting or potentially polluting incidents so that appropriate measures can be implemented. • Any contaminated material is disposed of in an appropriate manner and the potential risks associated with such spills are limited. • Removal of spills, rainwater and waste produced during clean-up of the bunds – shall be done in accordance to relevant specifications.	Low (-)
	Surface water quality. Medium (-)	**Prevent through management measures:** • Maintenance will be required on structures such as storm water diversion channels and berms associated with the routing of storm water around the operating pit and mining infrastructure areas.	Low (-)
	Surface Water Quantity. Medium (-)	**Prevent through management measures:** • The structures will be inspected regularly and maintenance work carried out as required. • Inspections will take place immediately prior to the rainy season. • Vegetation of residue deposits must be carried out as described for the general area above with topsoil and vegetation establishment. • Vegetation must be investigated annually.	Low (-)
	River characteristics (Beds, banks, course). High (-)	**Prevent through management measures:** • ECM must implement their Water Use Licence from the Department of Water and sanitation. • The reinstated drainage lines will be maintained in such a manner to prevent any erosion of the banks or bed. • A 100 m buffer zone is placed alongside the “riparian” banks of all water courses and that no activities should occur within this area. • “Riparian” habitat should be monitored for the spread of invasive or alien species and eradicated where identified.	Medium (-)

ACTIVITY Whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	POTENTIAL FOR RESIDUAL RISK
		• As the streams are generally dry it is not suitable for SASS5 aquatic invertebrate assessment, it is thus proposed that diatom sampling be conducted (if the streams are flowing) before mining commences and as part of the monitoring plan for the mine.	
	F. GROUNDWATER		
	Groundwater quantity – change in groundwater level and the potential (positive) impact on base flow of streams- (not predicted). Medium (+)	• All sulphate containing waste material should be stored underground and flooded as soon as possible to exclude oxygen as needed. • Major underground fractures encountered while mining must be sealed by grouting, both on inflow and outflow areas. As needed.	N/A
	Groundwater quality – Deterioration of groundwater quality down gradient of the mining operations due to plume movement. High (-)	**Prevent and reduce and remedy through management measures.** • All mined areas should be flooded as soon as possible to minimise oxygen from reacting with the remaining pyrite. Continuous. • The final backfilled opencast topography should be engineered such that runoff is directed away from the opencast areas. Continuous. • The final layer (just below the topsoil cover) should be as clayey as possible and compacted if feasible, to reduce recharge to the opencasts. Continuous. • Groundwater sampling must be conducted to establish a database of groundwater quality to assess plume movement trends. Quarterly. • Audit the monitoring network annually. • Conduct a final update of the numerical model to predict post mining impacts on the groundwater regime and to access potential liabilities. During closure phase.	Medium (-)
	Groundwater quality deterioration as a result of contaminants emanating from historic Oil, diesel and chemical spills and facilities. Medium (-)	**Manage and mitigate through management measures:** • Remove or remediate areas of hydrocarbon contaminated soils by following a risk-based approach, take action if a negative risk is found. A risk assessment should be conducted by a qualified hydro-geologist. Continuous.	Low (-)
	General. N/A	• A detailed mine closure plan should be prepared during the operational phase, including a risk assessment, water resource impact prediction etc. as stipulated in the DWA Best Practice Guidelines. Before final closure.	NA

ACTIVITY Whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	POTENTIAL FOR RESIDUAL RISK
		• The implementation of the mine closure plan and the application for the closure certificate can be conducted during the decommissioned phase.	
	G. TERRESTRIAL BIODIVERSITY (FAUNA AND FLORA)		
	Potential decrease in biodiversity on the study and surrounding area. Low (-)	**Reduce through management measures.** • No further vegetation clearance except for the removal of alien invasive species will be allowed. • Develop a management plan for immediate clean-up in case of pollution incidents at streams, rivers and drainage crossings. • Following soil placement during rehabilitation, all top soiled areas should be seeded to encourage vegetation establishment.	Low (-)
	Establishment of alien invasive species Medium (-)	**Prevent and control through management measures.** • An alien vegetation management plan should be implemented. • Regular removal of invasive alien species should be undertaken. This should extend right through to the closure phase of the project.	Low (-)
	H. AQUATIC BIODIVERSITY		
	Damage to aquatic ecosystems. High (-)	**Prevent and control through management measures:** No pioneering rhizomatous grasses such as *Cynodon dactylon* should be used as these species will pose problems for later agricultural cropping of the land.	Low (-)
	I. VISUAL AND LIGHTING		
	Visibility from sensitive receptors / visual scarring of the landscape as a result of the rehabilitation activities. Medium (-)	**Reduce through controlling management measures.** • Housekeeping on site should be enforced.	Low (-)
	Impact of security lighting on surrounding landowners and animals. Medium (-)	**Reduce through controlling measures.** • Unnecessary lights should be switched off during the day and / or night to avoid light pollution. • If lighting is required, the lighting will be located in such a place and such a manner so as to minimise any impact on the surrounding community.	Low (-)
	J. NOISE AND VIBRATION		
	Nuisance and health risks caused by an increase in the ambient noise level as a result of noise impacts associated with	**Reduce through controlling measures.** • Vehicles will be regularly serviced to ensure acceptable noise levels are not exceeded. Silencers will be utilised where possible.	Low (-)

ACTIVITY Whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	POTENTIAL FOR RESIDUAL RISK
	the operation of vehicles, EMV's and equipment. Low (-)	• Noise levels should be kept within acceptable limits. • With regard to unavoidable very noisy activities in the vicinity of noise sensitive areas, the Site Manager (SM) should liaise with local residents and how best to minimise impacts, and the local population should be kept informed of the nature and duration of intended activities. • Personal Protective Equipment to all persons working in areas where high levels of noise can be expected.	
	K. AIR QUALITY		
	Increased dust pollution due to rehabilitation activities and heavy-duty vehicles. Medium (-)	**Reduce through controlling measures.** • Dust suppression shall be implemented during dry periods and windy conditions. • All exposed surfaces should be minimised in terms of duration of exposure to wind and stormwater. • Ensure that shortest routes are used for material transport. • Keep to site speed limits. • Implement and actively monitor dust fallout generated on the borders of the site. • Implement site inspection to check for possible areas of dust generation not addressed or not effectively managed.	Low (-)
	Cumulative reduction in air quality. Medium (-)		Low (-)
	L. SOCIO-ECONOMIC		
	Decommissioning and Closure cost to Samancor. Medium (-)	**Prevent and reduce through management measures.** Assist communities to develop a community development strategy to address the potential impact of the mining in the area.	Medium (-)
	Strengthening of regional and local economy due to the income and knock-on opportunities. Medium (+)	• Establish, and communicate qualification criteria for, a bursary scheme for community members to focus on core mining skills. • Mentor empowerment groups. • Implement employment equity.	Medium (+)
	Increased pressure on water supply and sanitation as a result of inward migration. Medium (-)	**Prevent and reduce through management measures.**	Medium (-)

ACTIVITY Whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	POTENTIAL FOR RESIDUAL RISK
	Increase in waterborne diseases, as a result of inward migration and increased pressure on water supply and sanitation. Medium (-)	• Assist community chiefs and representatives to develop a strategy to limit and manage possible inward migration and population growth (Samancor Chrome). • Provide additional formal water supply infrastructure to affected communities. • Provide formal sanitation or semi-permanent sanitation facilities to affected communities (Government or aid agency). • Provide technical training to selected community members to allow them to operate boreholes and pumps effectively and to fix them when in need of repair.	Medium (-)
	Increase in health risk due to increased nitrate in borehole water. Medium (-)		Low (-)
	Poorer health care as a result of inward migration and increased pressure on medical resources. Medium (-)	**Prevent through management measures.** Cooperate with the Department of Land Affairs in the development of an implementation strategy and plan to ensure effective implementation of mitigation, especially monetary compensation and technical training.	Medium (-)
	Reduction in sense of place. Medium (-)	All mitigation measures prescribed throughout the construction, operational and decommissioning phases of the project.	Medium (-)
	M. ARCHAEOLOGICAL / CULTURAL		
	No additional impacts expected.	N/A	N/A
GENERAL – ALL PHASES			
	A. GROUNDWATER		
All mining activities	General N/A	• All the monitoring data needs to be collated and analysed on at least a bi-annual basis and included in management reports. This information will also be required by government departments (DWS, DFFE) for compliance monitoring. Bi-annual. • After 2 years from start of mining, the monitoring information collated should be used to update the groundwater flow and geochemical models. These models should thereafter be updated so that sufficient mitigation measures can be implemented. Management and mitigation plans should be continuously adapted using the monitoring data. Proposed within 2 years of mining starting and thereafter every 5 years.	N/A

ACTIVITY Whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	POTENTIAL FOR RESIDUAL RISK
	Acid Mine Drainage. Low (-)	No mitigation needed as potential to generate AMD is low, however proper lining systems for tailings dam must be implemented and dirty storm water generated on site must be kept on site in suitably constructed dams.	N/A
	B. SOCIO-ECONOMIC		
	Loss of income from agriculture land. High (-)	Provide monetary compensation to landowners, through the medium of a community trust.	Medium (-)
	Economic impact of supporting other households. High (-)	Cooperate in the development of an implementation strategy and SMME's.	Medium (-)
	Population growth Low (-)	Maximise local employment creation and targeted local procurement.	Low (-)
	Relocation of households. Low (-)	Provide assistance with technical training (at schools & in house), capacity building and skills development.	Low (-)
	Increased pressure on existing infrastructure. Medium (-)	Apply appropriate social investment funding.	Medium (-)
	Social conflict due to possible inward migration of outsiders, associated effects and competition for benefits within and between communities. Medium (-)	• Assist community chiefs and representatives to develop a strategy to limit and manage possible inward migration and population growth. • No relocation will be required. • Possible provision of additional infrastructure by external (government or aid) agency. • Control (mitigation) of these effects must come from within the existing community structure. • Assist communities to develop a community development strategy to address the potential impacts.	Medium (-)

ACTIVITY Whether listed or not listed.	**POTENTIAL IMPACT**	**MITIGATION TYPE**	**POTENTIAL FOR RESIDUAL RISK**
		• Avoid the establishment of a common trust account for the affected communities. Compensation issues will need to be dealt with separately for each community.	
CUMULATIVE IMPACTS (AVERAGE OF ALL IMPACTS IDENTIFIED ABOVE)			
All activities listed above.	All aspects listed above. Medium (-)	N/A	Medium (-)

3 OTHER INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

Compliance with the provisions of sections 24 (4) (a) and (b) read with section 24 (3) (a) and (7) of the National Environmental Management Act (Act 107 of 1998) the EIA report must include the:-

3.1 IMPACT ON THE SOCIO-ECONOMIC CONDITIONS OF ANY DIRECTLY AFFECTED PERSON

A Social and Labour Plan (SLP) will be developed for the Samancor Chrome Limited ECM Mareesburg Chrome Mine and will be included in the final EIA/EMPR.

3.2 IMPACT ON ANY NATIONAL ESTATE REFERRED TO IN SECTION 3(2) OF THE NATIONAL HERITAGE RESOURCES ACT

The results of Investigation, assessment, and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any national estate referred to in section 3(2) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) with the exception of the national estate contemplated in section 3(2)(i)(vi) and (vii) of that Act, attach the investigation report as Appendix 2.19.2 and confirm that the applicable mitigation is reflected in 2.5.3; 2.11.6.and 2.12.herein.

Not applicable to this application.

4 OTHER MATTERS REQUIRED IN TERMS OF SECTIONS 24 (4) (A) AND (B) OF THE ACT

Detailed, written proof of an investigation as required by section 24 (4)(b)(i) of the Act and motivation if no reasonable or feasible alternatives, as contemplated in sub-regulation 22(2)(h), exist. Such motivation must be attached as Appendix 7 – To be included final Scoping if requested by CA.

Not applicable to this application.

5 UNDERTAKING REGARDING CORRECTNESS OF INFORMATION

I, Louisa Thuynsma **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**

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Signature of the EAP

-END-

REFERENCES

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