

**SECTION 24G APPLICATION FOR THE RECTIFICATION OF
COMMENCEMENT OF ACTIVITIES FOR THE SAMANCOR MILLSSELL
AND WATERKLOOF SECTIONS OPENCAST MINING**

DRAFT SCOPING REPORT

DMR REF: NW 30/5/1/2/3/2/1/ (236) EM

Elemental REF: Waterkloof S24G_06_2022

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DOCUMENT HISTORY

Document Control, Quality Control and Disclaimer

Report	Draft Scoping Report for the Samancor Waterkloof Section S24G Opencast Mining		
Client	Samancor Chrome Ltd.: Western Chrome Mines (WCM)		
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Report Number	Waterkloof S24G_06_2023	Report Status	24 February to 27 March 2023
SAMRAD	Manual Submission	Report Date	20 February 2023

Report no	Date	Version	Status
0.0	24 February 2023	0.0	Public Review

DOCUMENT REVIEWED BY

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BASIS OF REPORT

This document has been prepared by Elemental Sustainability (Pty) Ltd. (ELEMENTAL) with reasonable skill, care and diligence, and taking account of the manpower, timescales and resources devoted to it in accordance with the appointment from the applicant.

This document has been prepared in accordance with the Department of Mineral Resources and Energy (DMRE) Scoping Report template format and was informed by the guidelines posted on the official DMRE website. This is in accordance with the requirements of the Minerals and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA). Given this, ELEMENTAL has included additional information in the Introduction section of the report that it deems necessary and relevant to setting the scene for the Environmental Impact Assessment (EIA) process. In addition, this report has been compiled in line with the requirements of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) and EIA regulations (2014), as amended.

The information contained in this report is relevant only to the specific project area and plan. It cannot be relied on for any other purpose or by any other person.

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This document may contain information of a specialised and/or highly technical nature and the reader is advised to seek clarification on any elements which may be unclear.



mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

DRAFT SCOPING REPORT

SECTION 24G APPLICATION FOR THE RECTIFICATION OF COMMENCEMENT OF ACTIVITIES FOR THE SAMANCOR MILLSSELL AND WATERKLOOF SECTIONS OPENCAST MINING NORTH WEST PROVINCE

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

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FILE REFERENCE NUMBER SAMRAD: Manual Submission
DMRE REFERENCE NUMBER: NW 30/5/1/2/3/2/1/ (236, 260 & 479) EM

EXECUTIVE SUMMARY

Elemental Sustainability (Pty) Ltd (Elemental) was appointed by Samancor Chrome Western Chrome Mines (Pty) Ltd. (WCM) to assist Samancor with a Section 24 G process for the unlawful commencement of construction and operation of activities including opencast mining at the Samancor WCM Waterkloof operation.

Mining Right Area

The mineral currently being mined at the Millsell and Waterkloof Sections is chromite and associated minerals in particular the LG6 and LG6A chromitite seams. The converted Mining Right NW30/5/1/2/2/236MR over portions of the farms Waterkloof 305 JQ, Waterval 306 JQ, Waterval 307 JQ, Kroondal 304 JQ and Waterval 303 JQ includes the minerals associated with the mining of chromitite ore, more specifically including platinum, palladium, rhodium, ruthenium, iridium and osmium, gold, silver, copper, nickel and cobalt, which may be extracted from normal mining of Chromite in the Middle Group (MG) and Lower Group (LG) seams.

Samancor Chrome believed that, collectively, the various approvals that it held, authorised it to carry out mining activities on Portion 146 of the farm Waterkloof 305 JQ. As a result, Samancor Chrome carried out further opencast activities on Portion 146 of the farm Waterkloof 305 JQ, from June 2021 to August 2022. Samancor constructed an opencast pit on the Waterkloof Section, as well as a new road, Waste Rock Dumps (WRD), Overburden dumps and a Run of Mine (ROM) Pad, within the existing mining right area. The Department of Mineral Resources and Energy (DMRE) undertook a site verification on 27 January 2022 and WCM submitted a response on 29 March 2022 to demonstrate authorisation in support of the opencast operation undertaken on the Relevant Portion.

Section 24F (1)(a) of NEMA indicates that *“No person may commence an activity listed or specified in terms of section 24(2)(a) or (b) unless the competent authority or the Minister of Mineral and Energy, as the case may be, has granted an Environmental Authorisation for the activity.”* The DMRE holds the view that WCM contravened section 24 of the NEMA, in that an opencast operation was undertaken without the required Environmental Authorisation (s).

Legislative Requirements

The most important legislation applicable to the project are the following:

- *National Environmental Management Act, 1998 (No. 107 of 1998) [as amended]* Section 28 (1):
Duty of Care and responsibilities to minimise and remediate environmental degradation. EIA Regulations, 2017 (Government Notices 983 and 984) [as amended];
- *EIA Regulations, 2014 (Government Notices 982) [as amended]*:
 - The operational and closure activities of the development have triggered listed activities that are listed in the EIA regulations for which a Scoping and Environmental Impact Assessment (EIA) process must be conducted;

- GNR 698 of 2017, Regulations relating to the procedure to be followed and the criteria to be considered when determining an appropriate fine in terms of Section 24G.
- *Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) [as amended]*
 - In order to apply for a mining right, an application was submitted on the Department of Mineral Resources' SAMRAD online application system;
- *National Water Act, 1998(Act No.36 of 1998) [as amended]*
 - Section 19: Prevention and remedying effects of pollution:
 - Section 21: Water Use Activities;
- *National Environmental Waste Act, 2008 (Act No. 59 of 2008) [as amended]:*
 - Section 16: General duty in respect of waste management;
- *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];*
- *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)*
- *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);*
- *Mine Health and Safety Act, 1996 (Act No. 29 of 1996) [as amended];*
- *National Heritage Resources Act, 1999 (Act No. 25 of 1999);*
- *National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) [as amended];*
- *National Dust Control Regulations, 2013 (Government Notice 827 of 2013);*
- *Veld and Forest Fire Act, 1998 (Act No. 101 of 1998) [as amended];*
- *National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) [as amended];*
- *Alien and Invasive Species Regulations (Government Notice 598 of 2014) and Alien and Invasive Species List, 2016 in terms of NEMBA (Government Notice 864 of 2016);*
- *Conservation of Agricultural Resources Act (no. 43 of 1983);*
- *Deeds registries Act, 1937 (Act no. 47 of 1937) [as amended];*
- *Hazardous Substances Act, 1973 (Act 15 of 1973) [as amended];*
- *Hazardous Chemical Substances Regulations, 1995 (Government Notice 1179 of 1995); and*
- *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.*

As the activities have already commenced, Samancor Chrome Limited (Western Chrome Mines (WCM)), the holder of the converted mining right (**NW 30/5/1/2/3/2/1/ 236 EM**) received a compliance notice in terms of Section 31L of the National Environmental Management Act, 1998 (Act No.107 of 1998) (NEMA):in respect of commencement of certain activities on Portion 146 of the farm Waterkloof 305 JQ Rustenburg (Relevant Portion) at WCM's). Section 24F (1)(a) of NEMA indicates that “No person may commence an activity listed or specified in terms of section 24(2)(a) or (b) unless the competent authority or the Minister of Mineral and Energy, as the case may be, has granted an Environmental Authorisation for the activity.” The DMRE holds the view

that WCM contravened section 24 of the NEMA, in that an opencast operation was undertaken without the required Environmental Authorisation (s).

Need and Desirability

The main benefits of the opencast mining project include:

- Direct economic benefits derived from wages, taxes and profits. Indirect economic benefits will be derived from the procurement of goods and services and the spending power of employees;
- Increased job security to employees already skilled in chromite mining within the area;
- Implementation of the project has resulted in continued skills development associated with mining;
- It contributes to the upliftment of living standards and the health and safety of the local community.
- The project will result in economic mining of a known resource; and
- The net benefit to South Africa is a product produced specifically the local commodity market, specifically for the foundry and metallurgical markets, and international markets.

The project is aligned with the objectives of the MPRDA (Act 28 of 2002)

- To promote economic growth and mineral development in the Republic;
- To promote employment and advance the social and economic welfare of all South Africans;
- To ensure that the nation's mineral resources are developed in an orderly and ecologically sustainable manner while promoting justifiable social and economic development; and
- To ensure that mining developments contribute towards the social-economic development of the area in which they are operating.

Samancor Chrome WCM has an existing Social and Labour Plan (SLP). The company, existing through its existing SLP, strives to provide socio-economic benefits for the target community, which includes the following:

- Promotion of employment and advance the social and economic welfare of all employees employed by Samancor Chrome WCM, Millsell and Waterkloof Operations, as well as all relevant stakeholders of the communities within which the Millsell and Waterkloof sections operate.
- Contribute to the transformation of the mining industry and ensure that as the holder of the mining right they continue to contribute towards the socio-economic development of the area where mining currently takes place including the major sending areas.
- Continued project support will be provided through the SLP.

The financial contribution as per the SLP is as follows:

- Continued project support through the SLP.

Alternatives

The no-go alternative is the option of not receiving authorisation for the activities conducted. The following negative impacts would result:

- There will be no economic boost in the region which would have fed into the industrial sector; and
- The anticipated job and skills development opportunities and employment the project presents will not be generated.

Public Participation

This section describes the public participation process (PPP) undertaken to date, in line with Chapter 6 of the EIA Regulations (2014) (as amended) and GNR698 of 2017. The intention of the PPP is to inform I&APs, in sufficient detail, of the project in order that I&APs may contribute meaningfully to the EIA process.

To date, the PPP has included notification of I&APs through distribution of an email or SMS, the placement of a newspaper advertisement (Appendix D5) and the placement of site notices (Appendix D2). A key aspect of public consultation is the notification of landowners, land occupiers and users within, and adjacent to, the application area (Appendix D3). As part of the PPP, a I&AP database has been developed for the project, as included in Appendix D1 of this report.

The Draft Scoping Report will be placed out for public review from 24 February 2023 to 27 March 2023. All comments received will be included in the Final Scoping Report to be submitted to the competent authority for adjudication.

DMRE review of the Scoping Report

On completion of the 30-day review period, a Final Scoping Report will be compiled which will include comments received during the I&AP review period. The report will be submitted to the DMRE for its review.

Specialist studies

As part of the Environmental Impact Assessment (EIA) phase for the Waterkloof Opencast Project the following specialist studies will be completed:

- Soil and Land Capability, including Agricultural Potential;
- Visual Impact Assessment;
- Terrestrial Fauna and Flora (Biodiversity) Assessment;
- Surface Water (Hydrology) Assessment and Aquatic Assessment;
- Geohydrological Impact Assessment;
- Noise Assessment;

- Social Economic Impact Assessment;
- Air Quality Impact Assessment;
- Closure and Rehabilitation Plans (including Financial Provisioning) – GNR 1147.

Impacts Associated with the Activities

Impacts have been provided within Section 9 below for the Operational and Closure Phases and a general summary is provided in Table 1 below.

Table 1: Summary of Potential Impacts during the various Project Phases

BIOPHYSICAL/SOCIO-ECONOMIC ASPECT	POTENTIAL IMPACT
Geology	Loss and sterilisation of mineral resources: The project has accessed mineral resources. The project has the potential to sterilise mineral resources through the disposal of mineral resources onto mineralised waste facilities (waste rock/overburden dumps).
Topography	Placement of waste rock/overburden and mine residue (topsoil): The project has temporarily altered the topography by creation of stockpiles and infrastructure.
Soils and land capability	Loss of soil and land capability: The project has the potential to compromise soil resources through physical disturbance (erosion and compaction) and/or pollution.
Biodiversity	Loss of biodiversity (terrestrial and aquatic): Impacts on biological aspects, ecosystems.
Surface water	Alteration of natural drainage patterns and pollution: the project may alter the surface water environment.
Groundwater	Groundwater contamination and lowering of groundwater levels: The project has the potential to contaminate groundwater resources and to lower groundwater levels through abstraction, dewatering of the aquifer.
Air	Air quality: The project may impact on the air quality and, therefore, will be subjected to an Air Quality Assessment.

Noise	Disturbing noise levels: The project can cause noise pollution through the mining activities.
Traffic	Road disturbance and traffic safety: The project may result in an increase of traffic in the area.
Heritage/cultural and palaeontological resources	Loss of heritage/cultural and palaeontological resources: The project does have the potential to damage heritage/cultural and palaeontological resources that may be present.
Socio-economic	Positive and negative socio-economic impacts: The project has the potential for positive and negative socio-economic impacts. Positive impacts include job creation and stimulation of the local and regional economy as well as a parallel economy to mining. Negative impacts include the influx of job seekers and related issues of crime, disease and disruption to social structures.
Land use	Change in land use: The project has the potential to impact on surrounding land uses due to the surface infrastructure that will be constructed.

Conclusion

A number of environmental impacts have been identified as requiring some more in-depth investigation and the identification of detailed mitigation measures, namely transport and air quality. Therefore, a detailed EIA is required to be undertaken in order to provide an assessment of these potential impacts and recommend appropriate mitigation measures.

The recommendation of this report is that detailed specialist studies for terrestrial ecology and heritage are undertaken on the project areas. The scope of work required in the EIR phase of the project is included in the ToR for EIA in this DSR.

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ABBREVIATIONS

ABA	Acid-Base Accounting
BC	Bushveld Complex
BIC	Bushveld Igneous Complex
BPEO	Best Practicable Environmental Option
CS	Community Survey
DAFF	Department of Agriculture, Forestry and Fisheries
DEA	Department of Environmental Affairs (now DFEE)
DFFE	Department of Forestry, Fisheries and Environment
DFS	Definitive Feasibility Study
DMR	Department of Mineral Resources (now DMRE)
DMRE	Department of Mineral Resources and Energy
DSR	Draft Scoping Report
DWS	Department of Water and Sanitation
EAP	Environmental Assessment Practitioner
ECA	Environmental Conservation Act (Act 73 of 1989)
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EIR	Environmental Impact Assessment Report
EMPr	Environmental Management Programme
GNR	Government Notice Regulation
I&APs	Interested and Affected Parties
IDP	Integrated Development Programme
IEM	Integrated Environmental Management
IHAS	Invertebrate Habitat Assessment System
IHIA	Intermediate Habitat Integrity Assessment
IWUL	Integrated Water Use License
IWULA	Integrated Water Use License Application
LED	Local Economic Development
LG	Lower Group
LOM	Life of Mine
MAMSL	Meter Above Mean Sea Level
MAR	Mean Annual Runoff
MG	Middle Group
MPRDA	Mineral and Petroleum Resources Development Act (Act 28 of 2002)

MR	Mining Right
MT	Million Tonnes
NEMA	National Environmental Management Act (Act 107 of 1998)
NEMAQA	National Environmental Management: Air Quality Act, 39 of 2004
NEMBA	National Environmental Management: Biodiversity Act (Act 10 of 2004)
NEMWA	National Environmental Management: Waste Act (Act 59 of 2008)
NFA	National Forest Act (Act 84 of 1998)
NHRA	National Heritage Resources Act (Act 25 of 1999)
NWA	National Water Act (Act 36 of 1998)
PAIA	Promotion of Access to Information Act (Act 2 of 2000)
PAJA	Promotion of Administrative Justice Act (Act 3 of 2000)
PES	Present Ecological State
PGM	Platinum Group Metals
PM10	Thoracic Particulate Matter
PM2.5	Inhalable Particulate Matter
PPP	Public Participation Process
RLM	Rustenburg Local Municipality
RLS	Rustenburg Layered Suite
ROM	Run of Mine
RVI	Riparian Vegetation Index
SAHRA	South African Heritage Resources Agency
SANRAL	South African National Roads Agency Limited
SANS	South African National Standard
SAR	Sodium Adsorption Ratio
SASS	South African Scoring System
TDS	Total Dissolved Solids
TIN	Total Inorganic Nitrogen
TPA	Tons Per Annum
TSP	Total Suspended Particulates
WCM	Western Chrome Mines
WML	Waste Management Licence
WRD	Waste Rock Dump
WWTW	Wastewater Treatment Works
WUL	Water Use Licence

IMPORTANT NOTICE

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

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

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

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

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

OBJECTIVE OF THE SCOPING PROCESS

The objective of the scoping process is to, through a consultative process—

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

1 INTRODUCTION

This Draft Scoping Report (DSR) documents the process and findings of the scoping phase as part of the Section 24G process for the unlawful commencement of construction and operation of activities including opencast mining at the Samancor Western Chrome Mine (WCM) Waterkloof operation. The DMRE has requested that a Scoping and Environmental Impact Assessment process be undertaken.

The DSR aims to provide stakeholders with information on the development including all its considered location, layout and technological alternatives, the scope of the environmental assessment, and the consultation process undertaken through the rectification process.

1.1 BACKGROUND INFORMATION

Samancor Chrome held an old order right as defined in the Mineral and Petroleum Resources Development Act, No. 28 of 2002 (MPRDA) (Old Order Right). The Old Order Right was applied for and granted to Samancor Chrome under the provisions of the Minerals Act 50 of 1991 (Minerals Act). As required under the Minerals Act, at that time, Samancor Chrome also held an approved environmental management programme (EM Programme) (approved on 22 November 1999). The EM Programme was subsequently amended on 16 March 2001. At that time, and under the Minerals Act, Samancor Chrome understood that it was lawfully entitled to mine the authorised minerals on, in, or under the mining area reflected in the Old Order Mining Right.

Samancor Chrome lodged the Old Order Mining Right for conversion under the provisions of the MPRDA, and the Old Order Mining Right was converted under reference NW30/5/1/2/2/236MR (19 November 2010) (Converted Mining Right). The Converted Mining Right was amended to include various portions of the Farms Waterkloof 305JQ and Waterval 306JQ (May 2010). The Converted Mining Right was amended again on 27 January 2022.

The EM Programme which remained in force and effect in terms of the transitional provisions of the MPRDA was amended (Addendum) on 10 March 2005. A further amendment was approved on 30 July 2014. As part of the conversion of the Old Order Mining Right, a Mining Works Programme was approved.

Based on (a) Samancor Chrome being the holder of an Old Order Right with the related approvals and (b) the conversion of the Old Order Mining Right, and the various amendments to the Converted Mining Right, the EM Programme and the Mining Work Programme, Samancor Chrome carried out mining operations for the authorised minerals, in respect of the Mining Area as defined in section 1 of the MPRDA.

The opencast mining activities that were historically undertaken on Portion 146 of the farm Waterkloof 305 JQ, commenced in approximately 1992 and continued until approximately 1994. The disturbed area was rehabilitated in approximately 1996.

The opencast mining activities were undertaken on Portion 146 of the farm Waterkloof 305 JQ as part of the approved activities contemplated in the EM Programme (22 November 1999) and the area was rehabilitated in accordance with the requirements at the time.

Samancor Chrome regularly reviews its mining programmes and plans, and, as part of the review, Samancor Chrome identified that opencast activities would be preferable, to underground activities for various reasons

including economic viability/feasibility, and accessibility of the minerals. The historical disturbances by way of opencast mining activities were also considered, together with the approvals which Samancor held at the time including the Converted Mining Right, the EM Programme and the Mining Works Programme.

When reviewing its mining plans, Samancor Chrome specifically took into account that infill drilling undertaken by Samancor Chrome, determined that not all chrome that could be extracted by opencast mining, as approved under the previous EM Programme, had been removed from the mining area, contemplated in the EM Programme.

Samancor Chrome believed that, collectively, the approvals that it held, authorised it to carry out mining activities on Portion 146 of the farm Waterkloof 305 JQ. As a result, Samancor Chrome carried out further opencast activities on Portion 146 of the farm Waterkloof 305 JQ, from June 2021 to August 2022.

As the area has already been mined, historically, and agricultural activities were taking place, the impact on biodiversity is considered to be insignificant as no natural vegetation accrued on the area.

As per Samancor Chrome's representations to the Department of Mineral Resources and Energy (DMRE) dated 28 March 2022, Samancor Chrome was of the understanding that the opencast mining on Portion 146 of the farm Waterkloof 305 JQ had been included in the approvals received by Samancor Chrome, including the EM Programme dated 22 November 1999, and the Mining Work Programme. Samancor Chrome did not intentionally or wilfully carry out the mining operations in contravention of NEMA (refer to Figure 1).

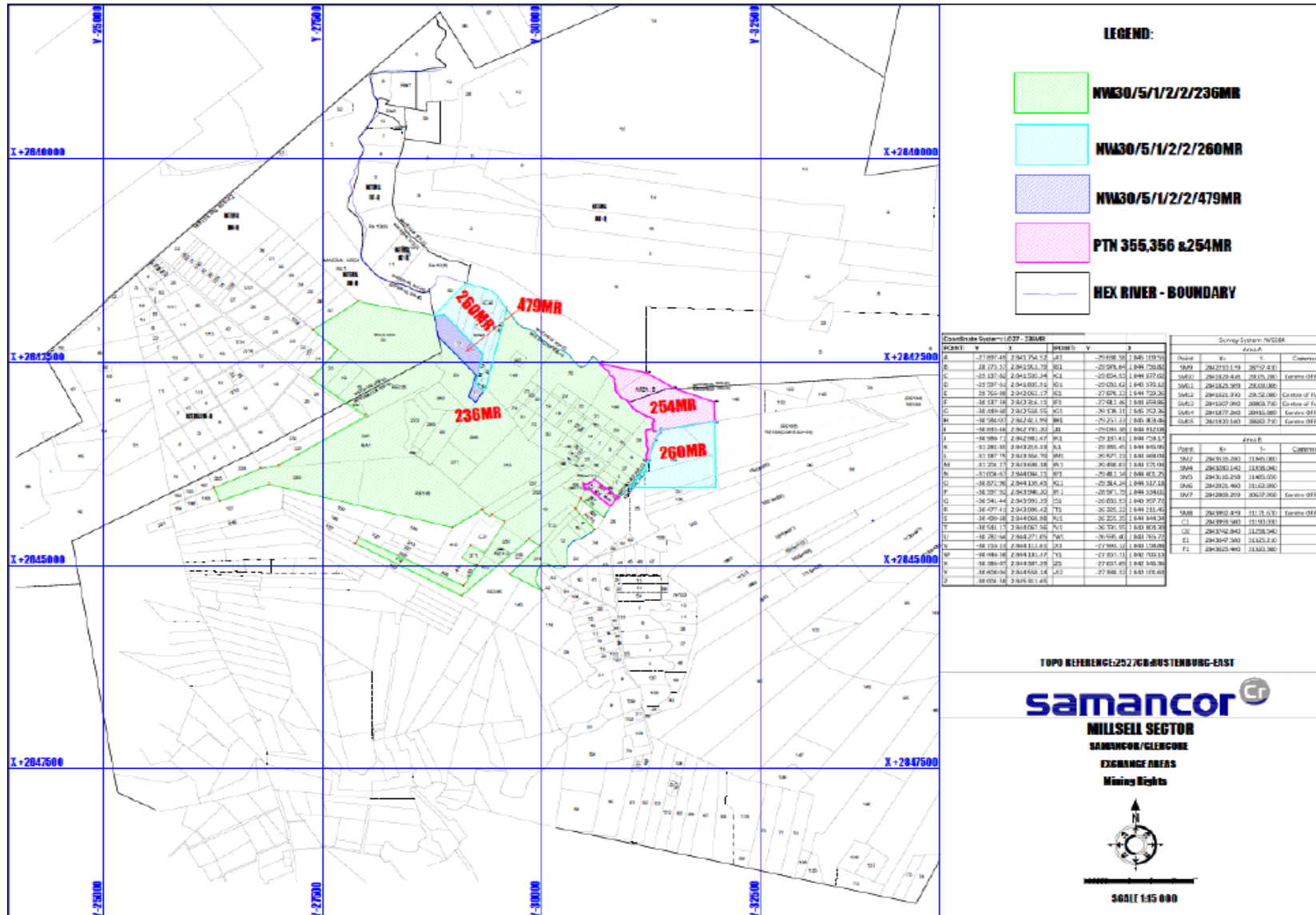


Figure 1: Samancor Chrome mining rights plan indicating Mining Rights NW30/5/1/2/2/236MR, NW30/5/1/2/2/479MR, NW30/5/1/2/2/260MR and NW30/5/1/2/2/254MR

Samancor has an approved EMP in terms of the MPRDA for the Millsell and Waterkloof Sections. Refer to Appendix 1 for a copy of the approval letter from the DMRE.

Samancor Chrome additionally evaluated potential extraction of the Lower Group (LG) and Middle Group (MG) succession of chromite seams on Portions 54, 112, 113, 146, 218, 231, 253, 262, 270, 296, 336, 341, 459, 513, 577, and RE 55 of the farm Waterkloof 305 JQ and Portions 18, 19, 20 and 24 of the farm Waterval 306 JQ through opencast operations. Refer to Figure 2 below.

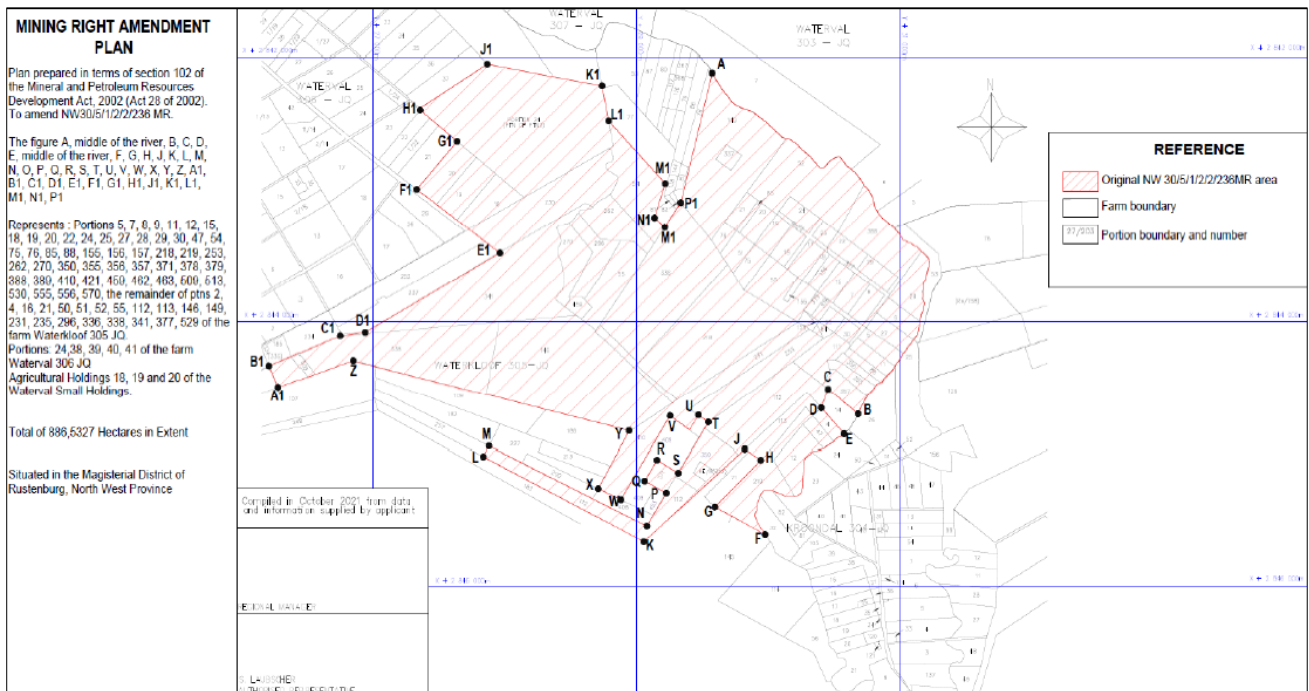


Figure 2: Amendment of plan to incorporate the chrome, associated mineral rights, opencast mining of Waterkloof 305 JQ within Converted Mining Right NW30/5/1/2/2/236MR

1.2 SCOPING TERMS OF REFERENCE

As indicated previously, the DMRE advised that a scoping and environmental impact assessment process be followed as part of the rectification process of the unlawful commencement and operation of site activities. The FSR usually forms part of an integrated process and in terms of the NEMA must be followed in order to meet the requirements of both the National Environmental Management Act and the NEM:WA.

This DSR and the subsequent FSR following public review will follow the format of a regular FSR which will provide a term of reference for EIA reporting in the event it is requested, however, specialist studies conducted on the development footprint have been attached to this report.

Based on the 2014 EIA Regulations, Government Notice Regulation (GNR) 982, as amended, a S&EIR process is applicable due to the applicability of the EIA Listing Notices, GNR 984, as amended. In order for the project to proceed, it will require an integrated EA and Waste Management Licence (WML) from the DMRE.

As defined in Appendix 2 of GNR 982, as amended, the objective of the scoping process is to, through a consultative process:

- Identify the relevant policies and legislation relevant to the activity;
- Motivate the need and desirability of the project activity, including the need and desirability of the activity in the context of the preferred location;
- Identify and confirm the preferred activity and technology alternative through an impact and risk assessment and ranking process;
- 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;
- Identify the key issues to be addressed in the assessment phase;
- 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
- 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.

Public participation is a requirement of scoping. It consists of a series of inclusive and culturally appropriate interactions aimed at providing stakeholders with opportunities to express their views, so that these can be considered and incorporated into the decision-making process. Effective public participation requires the prior disclosure of relevant and adequate project information to enable stakeholders to understand the risks, impacts, and opportunities of the Project. The objectives of the public participation process can be summarised as follows:

- Identify relevant individuals, organisations and communities who may be interested in or affected by the Project;
- Clearly outline the scope of the Project, including the scale and nature of the existing and development activities;

1.3 DRAFT SCOPING REPORT STRUCTURE

Table 2 provides the layout for the scoping report including the cross reference where each section can be found as per Appendix 2 of GNR 982 as amended.

Table 2: Report Structure

Environmental Regulation	Description	Section in Report
NEMA Regulation 982 (2014) as amended by GNR 326 (2017)		
Appendix 2(2)(a):	Details of – The EAP who prepared the report; and The expertise of the EAP, including a curriculum vitae;	Section 2.1 to 2.2 Appendix A
Appendix 2(2)(b):	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; Where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;	Section 5 and Appendix B
Appendix 2(2)(c):	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 a land where the property has not been defined, the coordinates within which the activity is to be undertaken;	Section 5 and Appendix C
Appendix 2(2)(d):	A description of the scope of the proposed activity, including – All listed and specified activities triggered; A description of the activities to be undertaken, including associated structures and infrastructure;	Section 3

Environmental Regulation	Description	Section in Report
Appendix 2(2)(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;	Section 3
Appendix 2(2)(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;	Section 6
Appendix 2(2)(h):	<p>A full description of the process followed to reach the proposed preferred activity, site and location within the site, including –</p> <ul style="list-style-type: none"> Details of all alternatives considered; Details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs; A summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them; The environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; 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 – <ul style="list-style-type: none"> Can be reversed; May cause irreplaceable loss or resources; and Can be avoided, managed or mitigated; 	<p>Section 6.1</p> <p>Section 4.5 and Appendix D</p> <p>Appendix D</p> <p>Section 7</p> <p>Section 9</p>

Environmental Regulation	Description	Section in Report
	<p>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;</p> <p>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;</p> <p>The possible mitigation measures that could be applied and level of residual risk;</p> <p>The outcome of the site selection matrix;</p> <p>If no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and</p> <p>A concluding statement indicating the preferred alternatives, including preferred location of the activity;</p>	
<p>Appendix 2(2)(i):</p>	<p>A plan of study for undertaking the environmental impact assessment process to be undertaken, including –</p> <p>A description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity;</p> <p>A description of the aspects to be assessed as part of the environmental impact assessment process;</p> <p>Aspects to be assessed by specialists;</p> <p>A description of the proposed method of assessing the environmental aspects, including a description of the proposed method assessing the environmental aspects to be assessed by specialists;</p>	<p>Section 10 and 11</p>

Environmental Regulation	Description	Section in Report
	<p>A description of the proposed method of assessing duration and significance;</p> <p>An indication of the stages at which the competent authority will be consulted;</p> <p>Particulars of the public participation process that will be conducted during the environmental impact assessment process; and</p> <p>A description of the tasks that will be undertaken as part of the environmental impact assessment process;</p> <p>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.</p>	
Appendix 2(2)(j)	<p>An undertaking under oath or affirmation by the EAP in relation to –</p> <p>The correctness of the information provided in the report;</p> <p>The inclusion of comments and inputs from stakeholders and interested and affected parties; and</p> <p>Any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties;</p>	Section 1212 and Appendix A
Appendix 2(2)(k):	<p>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;</p>	Appendix A
Appendix 2(2)(l):	<p>Where applicable, any specific information required by the competent authority; and</p>	N/A
Appendix 2(2)(m):	<p>Any other matter required in terms of section 24(4)(a) and (b) of the Act.</p>	N/A

2 CONTACT PERSON AND CORRESPONDENCE ADDRESS

2.1 DETAILS OF EAP WHO PREPARED THE REPORT

Name of the Environmental Assessment Practitioner:	Sonja van de Giessen
EAPASA:	2019/1496
Tel No.:	083 388 4633
E-mail address:	sonja@elemental-s.co.za

2.2 EXPERTISE OF THE EAP

2.2.1 THE QUALIFICATIONS OF THE EAP

In terms of Regulation 13 of the 2014 EIA Regulations (Government Notice R. 982) as amended by GNR517 (2021), an independent EAP, must be appointed by the applicant to manage the application. Elemental Sustainability (Pty) Ltd. has been appointed by the Applicant as the EAP and is compliant with the definition of an EAP as defined in Regulations 1 and 13 of the EIA Regulations and Section 1 of the NEMA. This includes, inter alia, the requirement that Elemental Sustainability is:

- Objective and independent;
- Has expertise in conducting EIAs;
- Complies with the NEMA, the Regulations and all other applicable legislation;
- Takes into account all relevant factors relating to the application;
- Provides full disclosure to the applicant and the relevant environmental authority;
- Identify viable Project alternatives that will assist the relevant authorities in making an informed decision;
- Identify shortcomings and gaps in existing information;
- Identify key concerns, raised by Stakeholders that should be addressed in the subsequent specialist studies;
- Highlight the potential for environmental impacts, whether positive or negative; and
- To inform and provide the public with information and an understanding of the Project, issues and solutions.

The declaration of independence of the EAP and the Curriculum Vita (indicating the experience with environmental impact assessments and relevant application processes) are attached as Appendix A to this report.

2.2.2 SUMMARY OF THE EAPS' EXPERIENCE

Attach the EAPs curriculum vitae as Appendix A.

Please refer to Table 3 for a summary of the qualifications and experience of the EAPs, as well as Appendix A of this report.

Table 3: Details of EAP

	EAP Information
Environmental Consultants:	Elemental Sustainability (Pty) Ltd.
Name of EAP	Sonja van de Giessen (<i>Pr.Sci.Nat</i> and EAPASA)
Qualifications:	<ul style="list-style-type: none"> • University of North West, M.Sc. Environmental management – 2018 • University of South Africa, BSc Hons Environmental Science – 2010 • Tshwane Technical College, B. Tech Degree Nature Conservation – 1998 • Tshwane Technical College, Diploma Nature Conservation - 1995
Professional affiliation(s):	<ul style="list-style-type: none"> • Natural Professional Scientist (<i>Pr. Sci.Nat.</i> Number: 400084/18) • Environmental Assessment Practitioner South Africa (EAPASA Number: 2019/1496)
Expertise of the EAP:	<ul style="list-style-type: none"> • Environmental management, specifically the mining industry sector, focusing on Environmental Impact Assessments; • Environmental Management Programmes; • Water Use Licence Applications; • Integrated Water and Waste Management Plans; and • Environmental Auditing.
Experience	10 years of experience.

3 POLICY AND LEGISLATIVE CONTEXT

This section provides an overview of the governing legislation identified which may relate to the project. A summary of the applicable legislation is provided in Table 4 below. The primary legal requirement for this project stems from the need for a Mining Right (MR) and an EA to be granted by the competent authority, which is the DMRE, in accordance with the requirements of both the NEMA and MPRDA. In addition, there are numerous other pieces of legislation governed by many acts, regulations, standards, guidelines and treaties on an international, national, provincial and local level, which should be considered to assess the potential applicability of these activities.

Table 4: Policy and Legislative Context

Applicable Legislation and Guidelines Used to Compile the Report	Reference where Applied
Constitution of South Africa, 1996 (Act No. 108 of 1996) [as amended] <ul style="list-style-type: none"> • <i>Section 24</i> 	The project has the potential to harm the environment and poses a risk to the health and wellbeing of people. The development, however, also has the potential to secure sustainable development through reusing

Applicable Legislation and Guidelines Used to Compile the Report	Reference where Applied
<p><i>Environment: Everyone has the right-</i></p> <p><i>(a) to an environment that is not harmful to their health or well-being; and</i></p> <p><i>(b) to have the environment protected, for the benefit of present and future generations through reasonable legislative and other measures that-</i></p> <p><i>i) prevent pollution and ecological degradation;</i></p> <p><i>ii) promote conservation; and</i></p> <p><i>Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.</i></p>	<p>process products and thereby limiting the use of natural resources.</p> <p>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 activity.</p>
<p>National Environmental Management Act (No. 107 of 1998) [as amended]</p> <ul style="list-style-type: none"> • <i>Section 28 (1)</i> <p><i>Duty of Care and responsibilities to minimise and remediate environmental degradation.</i></p>	<p>In terms of Section 24(2) of the NEMA, the Minister may identify activities which may not commence without prior authorisation. The Minister thus published GNR 983 (Listing Notice 1), 984 (Listing Notice 2) and 985 (Listing Notice 3), as amended, listing activities that may not commence prior to authorisation, 4 December 2014.</p> <p>The regulations outlining the procedures required for authorisation are published in GNR 982, [EIA] (4 December 2014), as amended. Listing Notice 1 identifies activities that require a Basic Assessment (BA) process to be undertaken, in terms of the EIA Regulations, prior to commencement of that activity. Listing Notice 2 identifies activities that require a S&EIR process to be undertaken, in terms of the EIA Regulations, prior to commencement of that activity. Listing Notice 3 identifies activities within specific areas that require a BA process to be undertaken, in terms of the EIA Regulations, prior to commencement of that activity.</p> <p>Elemental undertook a legal review of the listed activities according to the development activities conducted and concluded that the activities listed in the below section are considered applicable to the development. As such, the activities would have required an S&EIR process to be followed. An EA is required and will be applied for with the DMRE, however, Samancor had commenced with some activities prior to issuance of an EA and encroached onto unauthorised footprints.</p>
<p>EIA Regulations, 2014 (Government Notices 982 -985) [as amended]</p> <p><i>The proposed construction, operational and closure activities of the proposed development triggers listed activities that are listed in the EIA regulations for which a Scoping and Environmental Impact Assessment (EIA) process have to be conducted:</i></p>	<p>The project triggers various activities in terms of the EIA Regulations.</p>

Applicable Legislation and Guidelines Used to Compile the Report	Reference where Applied
Listing Notice 1, 2 & 3 have been triggered as well as GN633 for several waste activities requiring a Waste License as well.	
<p>EIA Regulations, 2014 (Government Notices 982-985)</p> <p><i>Chapter 6: Regulation 39 to 44: Public Participation;</i></p> <p><i>Chapter 4: Application for Environmental Authorisation:</i></p> <p><i>Part 3 Scoping and Environmental Impact Report (S&EIR)</i></p> <p><i>Appendix 2: Scoping Report</i></p> <p><i>Appendix 3: Environmental Impact Assessment Report</i></p> <p><i>Appendix 4: Environmental Management Programme</i></p> <p><i>Appendix 5: Closure Plan</i></p> <p><i>Appendix 6: Specialist Reports</i></p>	<p>The EIA Regulations, 2014 [as amended] prescribes inter alia:</p> <p>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.</p> <p>The content of specialist reports and closure plans are also provided.</p>
<p>Listing Notice 1: GNR 983, as amended</p>	<p>Activity 21D - Any activity including the operation of that activity which requires an amendment or variation to a right or permit in terms of section 102 of the Mineral and Petroleum Resources Development Act, as well as any other applicable activity contained in this Listing Notice or in Listing Notice 3 of 2014, required for such amendment.</p> <p>Description: The amendment of the mining right to include opencast mining triggers this activity.</p> <p>Activity 28: Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 01 April 1998 and where such development:</p> <p>(i) will occur inside an urban area, where the total land to be developed is bigger than 5 hectares; or</p> <p>(ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare; excluding where such land has already been developed for</p>

Applicable Legislation and Guidelines Used to Compile the Report	Reference where Applied
	<p><i>residential, mixed, retail, commercial, industrial or institutional purposes.</i></p> <p>Description: The opencast mining, ROM Pads, Road and Waste Rock, overburden Dumps trigger this activity as the land is agricultural land and is bigger than 1 ha.</p> <p>Activity 30: <i>Any process or activity identified in terms of section 53(1) of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004).</i></p> <p>Description: The Opencast Mine, ROM Pads, Road and Waste Rock, overburden Dumps trigger this activity.</p> <p>Activity 34 - <i>The expansion of existing facilities or infrastructure for any process or activity where such expansion will result in the need for a permit or licence or an amended permit or licence in terms of national or provincial legislation governing the release of emissions, effluent or pollution, excluding</i></p> <p><i>(i) where the facility, infrastructure, process or activity is 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;</i></p> <p><i>(ii) the expansion of existing facilities or infrastructure for the treatment of effluent, wastewater, polluted water or sewage where the capacity will be increased by less than 15 000 cubic metres per day; or</i></p> <p><i>(iii) the expansion is directly related to aquaculture facilities or infrastructure where the wastewater discharge capacity will be increased by 50 cubic meters or less per day.</i></p> <p>Description: The ROM and WRD trigger this activity.</p> <p>Activity 56 - <i>The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre (i) where the existing reserve is wider than 13.5 metres; or (ii) where no reserve exists, where the existing road is wider than 8 metres; excluding where widening or lengthening occur inside urban areas.</i></p>

Applicable Legislation and Guidelines Used to Compile the Report	Reference where Applied
	<p>Description: The existing road was widened to access the opencast mining area.</p>
<p>Listing Notice 2: GNR 984, as amended</p>	<p>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>(i) the undertaking of a linear activity; or</i> <i>(ii) maintenance purposes undertaken in accordance with a maintenance management plan.</i></p> <p>Description: Opencast Mine, ROM Pads, Road and Waste Rock, overburden Dumps resulted in the clearance of more than 20 hectares of indigenous vegetation.</p> <p>Activity 19 - The removal and disposal of a mineral, which requires a permission in terms of section 20 of the Mineral and Petroleum Resources Development Act, as well as any other applicable activity as contained in this Listing Notice, in Listing Notice 1 of 2014 or Listing Notice 3 of 2014, required to exercise the permission.</p> <p>Description: The opencast mining of chrome triggers this activity.</p> <p>Activity 27 - The development of a road <i>(iii) with a reserve wider than 30 metres; or</i> <i>(iv) catering for more than one lane of traffic in both directions;</i></p> <p>Description: Access and haul roads trigger this activity.</p>
<p>GNR 698 of 2017 “Regulations relating to the procedure to be followed and the criteria to be considered when determining and appropriate fine in terms of Section 24G.</p>	<p>The PP process for the S24G application has taken GNR 698 into consideration.</p>
<p>Mineral and Petroleum Resources Development Act, 2002 (Act. 28 of 2002) [as amended]:</p>	<p>A Section 102 amendment has been submitted to the DMRE.</p>
<p>National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) [as amended]</p> <ul style="list-style-type: none"> • Section 16 <i>General duty in respect of waste management;</i> • Section 17; <i>Reduction, re-use, recycling and recovery of waste;</i> • Section 18; and 	<p>In terms of section 19 of the NEM:WA, a list of waste management activities that have, or are likely to have a detrimental effect on the environment were published in GNR 921 (November 2013), as amended. A person who wishes to commence, undertake or conduct a waste management activity listed under Category A, must conduct a basic assessment process, while a person who wishes to undertake a Category B activity must conduct a S&EIR process as set out in the EIA Regulations made under section 24(5) of the NEMA as part of a WML application contemplated in section 45 read with section 20(b) of this Act. A person who wishes to commence, undertake or conduct a waste management activity listed</p>

Applicable Legislation and Guidelines Used to Compile the Report	Reference where Applied
<p><i>Extended producer responsibility; and</i></p> <ul style="list-style-type: none"> <i>Section 21</i> <p><i>General requirements for storage of hazardous and general waste.</i></p>	<p>under Category C, must comply with the relevant norms or standards as listed in GNR 921, as amended. Elemental undertook a review of the listed activities according to the development activities conducted and concluded that Listed Activity 11 under Category B is considered applicable. A WML is required and will be applied for with the DMRE.</p>
<p>GNR 921: Category B</p>	<p>Activity 11 - <i>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 MPRDA.</i></p> <p>Description: The Waste rocks, overburden dumps and ROM stockpile pads trigger this activity.</p>
<p>National Environmental Management: Biodiversity Act, 2004 (No. 10 of 2004) (NEM:BA)</p>	<p>The NEMBA was promulgated in June 2004 within the framework of NEMA to provide for the management and conservation of national biodiversity. The NEMBA's primary aims are for the protection of species and ecosystems that warrant national protection, the sustainable use of indigenous biological resources, the fair and equitable sharing of benefits arising from bioprospecting involving indigenous biological resources. In addition, the NEMBA provides for the establishment and functions of a South African National Biodiversity Institute (SANBI).</p> <p>SANBI was established by the NEMBA with the primary purpose of reporting on the status of the country's biodiversity and conservation status of all listed threatened or protected species and ecosystems. The biodiversity assessment identified critical biodiversity areas (CBAs) which represent biodiversity priority areas which should be maintained in a natural to near natural state. The CBA maps indicate the most efficient selection and classification of land portions requiring safeguarding in order to meet national biodiversity objectives. As such, an Ecological Assessment will be undertaken as part of the EIA process.</p> <p>The Conservation of Agricultural Resources Act (No. 43 of 1983) (CARA) Regulations with regards to alien and invasive species have been superseded by the NEMBA – Alien and Invasive Species (AIS) Regulations which came into act on 1 October 2014. Specific management measures for the control of alien and invasive plants will be included in the Environmental Management Programme (EMPR).</p>
<p>The National Water Act (No. 36 of 1998)</p>	<p>The NWA provides the framework to protect water resources against over exploitation and to ensure that there is water for social and economic development, human needs and to meet the needs of the aquatic environment.</p> <p>The Act defines water source to include watercourses, surface water, estuary or aquifer. A watercourse is defined in the Act as a river or spring, a natural channel in which water flows regularly or intermittently, a wetland, lake or dam into which or from which water flows, and</p>

Applicable Legislation and Guidelines Used to Compile the Report	Reference where Applied
	<p>any collection of water that the Minister may declare a watercourse.</p> <p>Section 21 of the Act outlines a number of categories that require a water user to apply for a Water Use License (WUL) and Section 22 requires water users to apply for a General Authorisation (GA) with the Department of Water and Sanitation (DWS) if they are under certain thresholds or meet certain criteria. The list of water uses that require a WUL under section 21 are presented below:</p> <ul style="list-style-type: none"> a) Taking water from a water resource; b) Storage of water; c) Impeding or diverting the flow of water in a watercourse; d) Engaging in a stream flow reduction activity; e) Engaging in a controlled activity; f) Discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit; g) Disposing of waste in a manner which may detrimentally impact on a water resource; h) Disposing in any manner of water which contains waste from, or which has been heated in. any industrial or power generation process; i) Altering the bed, banks, course or characteristics of a watercourse; 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; and k) Using water for recreational purposes. <p>Section 21 (c) and (i) as well as 21 (g) are anticipated for the activities conducted due to proximity of the opencast area to the water course.</p>
Regulations Regarding the Procedural Requirements for Water Use Licence Applications and Appeals published in terms of NWA in Government Notice 267 of March 2017	The Regulations will be taken into consideration during the Application process and will be utilised by the Wetland and aquatic specialist to determine the impact of the Waterkloof opencast section on the wetland area.
Several General Authorisations have been published in terms of Section 39 of the NWA (various dates)	
<p>Mine Health and Safety Act, 1996 (Act No. 29 of 1996) [as amended] and associated regulations</p> <ul style="list-style-type: none"> • <i>Chapter 2, Sections 2 – 4</i> <p><i>Responsibilities of owner</i></p> <ul style="list-style-type: none"> • <i>Chapter 2, Sections 5 – 13</i> <p><i>Responsibilities of manager;</i></p> <ul style="list-style-type: none"> • <i>Chapter 2, Sections 14 – 18;</i> <p><i>Documentation requirements;</i></p> <ul style="list-style-type: none"> • <i>Chapter 2, Section 19 – 20 and 22 to 24</i> 	The project activities may create an environment that is not safe and healthy for workers on and visitors to the site (if not managed correctly). The act provides for measures to prevent threats to the health and safety of humans in the development area. Samancor WCM has a Safety, Health, Environment and Quality Policy in place and has an existing framework in setting Safety, Health, Environmental and Quality objectives.

Applicable Legislation and Guidelines Used to Compile the Report	Reference where Applied
<p><i>Employee's rights and duties; and</i></p> <ul style="list-style-type: none"> • <i>Chapter 2, Section 21</i> <p><i>Manufacturer's and supplier's duty for health and safety.</i></p>	
<p>National Heritage Resources Act, 1999 (Act No. 25 of 1999)</p> <ul style="list-style-type: none"> • <i>Section 44 (1);</i> <p><i>Preservation and protection of heritage resources;</i></p> <ul style="list-style-type: none"> • <i>Section 3 Types and ranges of heritage resources (i) (i);</i> <p><i>Objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens.</i></p>	<p>The NHRA serves to protect national and provincial heritage resources across South Africa. The NHRA provides for the protection of all archaeological and palaeontological sites, the conservation and care of cemeteries and graves by the South African Heritage Resources Agency (SAHRA), and lists activities that require any person who intends to undertake to notify the responsible heritage resources agency and furnish details regarding the location, nature, and extent of the activities conducted.</p> <p>In terms of the Section 38 of NHRA, any person who intends to undertake a linear development exceeding 300m in length or a development that exceeds 5000m² must notify the heritage resources authority and undertake the necessary assessment requested by that authority.</p>
<p>National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) [as amended]</p> <ul style="list-style-type: none"> • <i>Section 32</i> <p><i>Control of dust</i></p> <ul style="list-style-type: none"> • <i>Section 34</i> <p><i>Control of noise</i></p>	<p>According to Section 22 of the NEM:AQA, no person may, without a provisional atmospheric emission licence or an AEL, conduct an activity that is -</p> <p>Listed on the national list anywhere in the Republic; or</p> <p>Listed on the list applicable in a province anywhere in that province.</p> <p>Listed activities and associated minimum emission standards (MES) were published in Government Notice 248 of 2010, Government Gazette 33064 in-line with Section 21 of NEM:AQA. An amended list of activities was published in Government Notice 893 of 2013, Government Gazette 37054, in Government Notice 551 of 2015, Government Gazette 38863 and further in Government Notice 1207 of 2018, Government Gazette 42013.</p> <p>Dust emissions standards will be applicable as per the 2013 National Dust Control Regulations (GNR 827) in terms of Section 32 of NEM:AQA and an air quality impact assessment (AQIA) will be conducted as part of the EIA process.</p>
<p>Mining and Biodiversity Guideline (2013)</p>	<p>The Act, regulation and guideline have informed project planning and will be taken into account in the assessment and mitigation of impacts.</p>
<p>Draft National Biodiversity Offset Policy, 2017</p>	<p>Not applicable to this project.</p>
<p>Hazardous Substances Act, 1973 (Act 15 of 1973) [as amended]</p> <ul style="list-style-type: none"> • <i>Section 2</i> <p><i>Declaration of grouped hazardous substances;</i></p> <ul style="list-style-type: none"> • <i>Section 4</i> 	<p>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.</p>

Applicable Legislation and Guidelines Used to Compile the Report	Reference where Applied
<p><i>Licensing;</i></p> <ul style="list-style-type: none"> • <i>Section 16</i> <p><i>Liability of employer or principle</i></p> <ul style="list-style-type: none"> • <i>Section 9 (1)</i> <p><i>Storage and handling of hazardous chemical substances</i></p> <ul style="list-style-type: none"> • <i>Section 18</i> <p><i>Offences</i></p>	
<p>Hazardous Chemical Substances Regulations, 1995 (Government Notice 1179 of 1995)</p> <ul style="list-style-type: none"> • <i>Section 4</i> <p><i>Duties of persons who may be exposed to hazardous chemical substances</i></p> <ul style="list-style-type: none"> • <i>Section 9A (1)</i> <p><i>Penalties</i></p>	<p>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.</p>
<p>Noise Control Regulations (The Republic of South Africa, 1992) published in terms of Section 25 of the Environment Conservation Act (Act no. 73 of 1989)</p>	<p>The regulations define the following:</p> <ul style="list-style-type: none"> • Controlled areas; and • Disturbing noise <p>Limits are provided for rating levels for outdoor noise. To be utilised by the Noise specialist to determine the impact and mitigation measures.</p>
<p>Deeds Registries, 1937 (Act No. 47 of 1937) [as amended]</p>	<p>Registration of servitudes and deed titles.</p>
<p>National Framework for Sustainable Development (2008)</p>	<p>The purpose of the National Framework on Sustainable Development is to enunciate South Africa's national vision for sustainable development and indicate strategic interventions to re-orientate South Africa's development path in a more sustainable direction. It proposes a national vision, principles and areas for strategic intervention that will enable and guide the development of the national strategy and action plan.</p>
<p>Bojanala District Municipality IDP (2020/2021)</p>	<p>Mining, especially of the Platinum Group Metals (PGM) remains one of the provinces key economic sectors, realising the contestation of resources through mining the negative impacts require management and positive mitigation interventions – environment, water, air pollution and agricultural land.</p> <p>The development frameworks have informed project planning and the need and desirability of the project, and will be taken into account in the assessment and mitigation of impacts during the EIA phase</p>

Applicable Legislation and Guidelines Used to Compile the Report	Reference where Applied
Rustenburg Local Municipality IDP (2022-2027)	<p>Important sectors in this area include agriculture, mining, urban development and tourism. The economic, social and physical characteristics of Rustenburg are largely determined by the presence of mining activities within its Municipal Area. In 2020, the mining sector was the largest within Rustenburg Local Municipality accounting for R 52.1 billion or 76.6% of the total GVA in the local municipality's economy. The mining sector is estimated to be the largest sector within the Rustenburg Local Municipality in 2025, with a total share of 65.3% of the total GVA (as measured in current prices), growing at an average annual rate of 3.9%. The Rustenburg Municipal Area lies on the western edge of the BIC and is one of the most heavily mineralised districts of the world. The Merensky Reed and the UG2 chromitite layers are renowned for their PGM content and together they are the world's largest depository of PGMs. The development frameworks have informed project planning and the need and desirability of the project and will be taken into account in the assessment and mitigation of impacts during the EIA phase.</p>

4 SCOPING METHODOLOGY

The scoping process was initiated in accordance with Appendix 2 of GNR 982, as amended, pertaining to applications subject to a rectification process.

4.1 APPLICATION

The Section 24G application process requires that an advertisement be published indicating the tasks that have commenced unlawfully, with the application form submitted at least 20 days after publication of the advert. A newspaper advert was published in the Rustenburg Herald on 27 January 2023 and the application form submitted to the DMRE on **10 November 2022**.

As indicated in the advertisement and Table 4 above in Section 3, the Listed Activities, triggered by the activities on site include the following:

- Listing Notice 1 (GN 983 of 2014, as amended), Activities 21D, 27, 28, 30, 34 and 56.
- Listing Notice 2 (GN 984 of 2014, as amended), Activities 15, 19 and 27.
- National Environmental Waste Management Act (NEM:WA, 2009) – (GNR 921 of 2013, as amended), Activity B11.

The draft scoping report (DSR) will be submitted to the DMRE and for comment to the public on 24 February **2023**.

4.2 PROCESS AND PHASING

The process consists of various phases with associated timelines as defined in GNR 982, as amended. The process can generally be divided into four main phases, namely; (i) an unregulated Pre application Phase, (ii) an Application and Scoping Phase (**current phase**), (iii) an Impact Assessment Phase and (iv) Authorisation and Appeal Phase, as indicated in. The DMRE has requested that a Scoping/EIA process be undertaken.

The main objectives of the phases can be described as follows:

- Pre-Application Phase:
 - Undertake consultation meetings with the relevant authorities to confirm the required process and general approach to be undertaken;
 - Identify stakeholders, including neighbouring landowners/residents and relevant authorities;
 - Compile a DSR describing the affected environment and present an analysis of the potential environmental issues and benefits arising from the activities conducted that may require further investigation in the Impact Assessment Phase;
 - Develop draft terms of reference for the specialist studies to be undertaken in the Impact Assessment Phase; and
 - Inform stakeholders of the activities conducted, feasible alternatives and the rectification process and afford them the opportunity to register and participate in the process and identify any issues and concerns associated with the activities conducted.

- Application and Scoping Phase:
 - Compile and submit application forms to the competent authority and pay the relevant application fees;
 - Incorporate comments received from stakeholders during the pre-application phase into the DSR;
 - Should significant amendments be required, release the updated DSR for a 30 day comment period to provide stakeholders with the opportunity to review the amendments as well as provide additional input if required; and
 - Submit the FSR, following the consultation period, to the relevant authorities, in this case the DMRE, for acceptance/rejection.

- Impact Assessment Phase:
 - Continue to inform and obtain contributions from stakeholders, including relevant authorities, stakeholders, and the public and address their relevant issues and concerns;
 - Assess in detail the potential environmental and socio-economic impacts of the project as defined in the DSR;
 - Identify environmental and social mitigation measures to avoid and/or address the identified impacts;
 - Develop and/or amend environmental and social management plans based on the mitigation measures developed in the Environmental Impact Assessment Report (EIAR);
 - Submit the Draft EIAR and associated EMPR to the CA, commenting authorities and I&APs for comment;
 - Submit the Final EIAR and the associated EMPR to the competent authority to undertake the decision-making process;

- Authorisation and Appeal Phase;
 - The DMRE to provide written notification of the decision to either grant or refuse the EA and WML for the activities conducted; and
 - Notify all registered I&APs of the decision and right to appeal.

4.3 BASELINE ENVIRONMENTAL ASSESSMENT

The description of the baseline environment has been compiled through a combination of site investigations, desktop reviews and information obtained from the existing and new specialist assessments. Desktop reviews made use of available information including existing reports, aerial imagery and mapping.

4.4 IDENTIFICATION AND EVALUATION OF POTENTIALLY SIGNIFICANT IMPACTS

4.4.1 METHODOLOGY USED IN DETERMINING THE SIGNIFICANCE OF ENVIRONMENTAL IMPACTS

A “significant impact” is defined as it is defined in the EIA Regulations (2014): “*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 EIA 2014 Regulations [as amended] 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) 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.

Elemental Sustainability 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.

4.5 STAKEHOLDER ENGAGEMENT

4.5.1 PURPOSE OF STAKEHOLDER ENGAGEMENT

Stakeholder engagement comprises a series of inclusive and culturally appropriate interactions aimed at providing stakeholders with opportunities to express their views, so that these can be considered and incorporated into the rectification process. Effective stakeholder engagement requires the prior disclosure of

relevant and adequate project information to enable stakeholders to understand the risks, impacts, and opportunities of the activities conducted.

The objectives of the stakeholder engagement process can be summarised as follows:

- Identify relevant individuals, organisations and communities who may be interested in or affected by the activities conducted;
- Clearly outline the scope of the activities conducted, including the scale and nature of the existing and activities conducted;
- Identify viable activities conducted alternatives that will assist the relevant authorities in making an informed decision;
- Identify shortcomings and gaps in existing information;
- Identify key concerns, raised by stakeholders that should be addressed in the subsequent specialist studies;
- Highlight the potential for environmental impacts, whether positive or negative; and
- To inform and provide the public with information and an understanding of the activities conducted, issues and solutions.

4.5.2 WHO IS AN INTERESTED AND AFFECTED PARTY?

An interested and affected party (I&AP) is defined as any person, group of persons or organisations interested in or affected by an activity, and any organ of state that may have jurisdiction over any aspect of the activity.

The difference between an I&AP and a registered I&AP:

- An I&AP can be directly or indirectly impacted on by the activities conducted.
- A registered I&AP is a person whose name has been placed on the register of registered I&APs. According to the PPP Guidance document, 2017, only registered I&APs will be notified:
 - Of the availability of reports and other written submissions made to the Competent Authority (CA) by the Applicant; and
 - Of the outcome of the application, the reasons for the decision, and that an appeal may be lodged against a decision.

4.5.3 SECTION 39: ACTIVITY ON LAND OWNED BY PERSON OTHER THAN THE PROPONENT - SUBREGULATION 1 AND 2(A), (B) AND (C)

(1) If the proponent is not the owner or person in control of the land on which the activity is to be undertaken, the proponent must, before applying for an environmental authorisation in respect of such activity, obtain the written consent of the landowner or person in control of the land to undertake such activity on that land.

(2) Subregulation (1) does not apply in respect of—

(a) linear activities;

(b) activities directly related to prospecting or exploration of a mineral and petroleum resource or extraction and primary processing of a mineral or petroleum resource; and (paragraph b deleted by GN 517 of June 2021 and reinstated by GN 1816 of March 2022)

(c) strategic integrated projects as contemplated in the Infrastructure Development Act, 2014.

Samancor does have an agreement in place with the landowner.

4.5.4 SECTION 41: PUBLIC PARTICIPATION PROCESS

4.5.4.1 SECTION 41, SUBREGULATION 2 (A) – SITE NOTICES

- 1) *The person conducting a public participation process must take into account any relevant guidelines applicable to public participation as contemplated in section 24J of the Act and must give notice to all potential interested and affected parties of an application or proposed application which is subjected to public participation by—*
- a) *fixing a notice board at a place conspicuous to and accessible by the public at the boundary, on the fence or along the corridor of—*
 - i. *the site where the activity to which the application or proposed application relates is or is to be undertaken; and*
 - ii. *any alternative site.*

Five (5) site notices were erected within and surrounding the proposed project area. The site notices have been placed in conspicuous areas that are accessible by the public at the boundary. The site notices included a short background to the project, the locality of the project, information on the activities that have been triggered and details of how the Environmental Assessment Practitioner (EAP) can be contacted to provide any comments. Refer to Appendix D2 for a copy of the site notice and where these have been placed.

4.5.4.2 SECTION 41, SUBREGULATION 2 (B) – WRITTEN NOTICE

- b) *giving written notice, in any of the manners provided for in section 47D of the Act, to—*
- i. *the occupiers of the site and, if the proponent or applicant is not the owner or person in control of the site on which the activity is to be undertaken, the owner or person in control of the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken;*
 - ii. *owners, persons in control of, and occupiers of land adjacent to the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken;*
 - iii. *the municipal councillor of the ward in which the site and alternative site is situated and any organisation of ratepayers that represent the community in the area;*
 - iv. *the municipality which has jurisdiction in the area;*
 - v. *any organ of state having jurisdiction in respect of any aspect of the activity; and*
 - vi. *any other party as required by the competent authority;*

All preidentified I&APs have been provided with a written notice (refer to Appendix D3) of the project.

Written notices have also be sent to the municipality that has jurisdiction in the area and all organs of state as preidentified and that register for the project. This includes the following:

- South Africa Heritage Resource Agency (SAHRA);
- Department of Roads and Transport;
- North West Department: Economic Development, Environment, Conservation and Tourism;
- North West Department: Agriculture and Rural Development;
- Department of Agriculture Forestry and Fisheries (DAFF – now grouped with Environmental Affairs, forming DFFE since March 2021);
- Department of Mineral Resources and Energy (DMRE);
- Department of Water and Sanitation (DWS);
- Department of Forestry, Fisheries and the Environment (DFFE);
- North West Agriculture, Land Reform and Rural Development;
- North West Parks Board;
- North West Department: Public Works and Roads;
- North West Department: Human Settlements;
- Department of Social Development – Provincial;
- South African National Roads Agency (Bakwena Plantinum);
- Provincial Heritage Authority;
- Eskom Holdings SOC Limited;
- Rustenburg Local Municipality;
- Bojanala District Municipality; and
- Ward 34 Councillor.

4.5.4.3 DETAILS OF BACKGROUND INFORMATION DOCUMENT (BID)

A BID in English was compiled for distribution (refer to Appendix D4 for a copy of the BID). The BID contains the following information:

- Project name;
- Applicant name;
- Project location (including map of study area);
- Description of the EA application process, EIA flow chart, and public participation process;
- Information on future document review opportunities;
- A detailed questionnaire/ I&AP registration form; and
- Relevant EAP contact person for the project.

Copies of the BID will be emailed to the current landowner and adjacent landowners. Copies of the BID will also be given to occupiers of the site and I&APs via direct consultation or be emailed to potential I&APs. Copies of the BID documents will be hand delivered to the local communities and emailed to government departments and municipalities.

The following government departments and municipalities shall receive copies of the BID:

- DWS - North West Regional Office;

- Department of Economic Development, Environment, Conservation and Tourism Department of Land Affairs;
- Bojanala District Municipality; and
- Rustenburg Local Municipality.

Copies of the BID will be distributed to any other parties if required by the competent authority. A copy of the BID will be included in the FSR.

4.5.4.4 SECTION 41, SUBREGULATION 2 (C), (D) & (E) – ADVERTISEMENTS

- c) *placing an advertisement in—*
- i. *one local newspaper; or*
 - ii. *any official Gazette that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these Regulations;*
- d) *placing an advertisement in at least one provincial newspaper or national newspaper, if the activity has or may have an impact that extends beyond the boundaries of the metropolitan or district municipality in which it is or will be undertaken: Provided that this paragraph need not be complied with if an advertisement has been placed in an official Gazette referred to in paragraph (c)(ii); and*
- e) *using reasonable alternative methods, as agreed to by the competent authority, in those instances where a person is desirous of but unable to participate in the process due to—*
- i. *illiteracy;*
 - ii. *disability; or*
 - iii. *any other disadvantage.*

As the boundary of the project is restricted to the Rustenburg area, an advertisement was placed in the local newspaper. The Rustenburg Herald, in terms of the requirements of GNR 267 of 2017 as per the National Environmental Management Act, 1998 (Act No. 107 of 1998) containing the following information:

- Project name;
- Applicant name;
- Project location;
- Nature of the activity; and
- Relevant EAP contact person for the project.

A copy of the advert is included in Appendix D1.

4.5.4.5 SECTION 41, SUBREGULATION 3

- 3) *A notice, notice board or advertisement referred to in subregulation (2) must—*
- a) *give details of the application or proposed application which is subjected to public participation; and*
 - b) *state—*
 - i. *whether basic assessment or S&EIR procedures are being applied to the application;*
 - ii. *the nature and location of the activity to which the application relates;*

- iii. *where further information on the application or proposed application can be obtained; and*
- iv. *the manner in which and the person to whom representations in respect of the application or proposed application may be made.*

As indicated in Section 4.5.4.2 and Section 4.5.4.4 above, both the site notice and the advert include all information as per the requirements of Section 41, subregulation 3.

The EAPs contact number and email address is stated on the site notice and advert. Comments/concerns and queries will be encouraged to be submitted in either of the following manners:

1. Electronically (email);
2. Telephonically; and/or
3. Written letters.

4.5.4.6 SECTION 41, SUBREGULATION 4

- 4) *A notice board referred to in subregulation (2) must—*
 - a) *be of a size of at least 60 cm by 42 cm; and*
 - b) *display the required information in lettering and in a format as may be determined by the competent authority.*

Site notices erected around the boundary of the proposed Millsell-Waterkloof Opencast Mine Project were at least 60 cm by 42 cm. The proposed format is Arial and the font size is 14. A locality map is included on the site notice. A copy of the site notice, as well as a locality map of where the site notices have been placed is included in Appendix D2 of the DSR.

4.5.4.7 SECTION 41, SUBREGULATION 5, 6 & 7

- 5) *Where public participation is conducted in terms of this regulation for an application or proposed application, subregulation (2)(a), (b), (c) and (d) need not be complied with again during the additional public participation process contemplated in regulations 19(1)(b) or 23(1)(b) or the public participation process contemplated in regulation 21(2)(d), on condition that—*
 - a) *such process has been preceded by a public participation process which included compliance with subregulation (2)(a), (b), (c) and (d); and*
 - b) *written notice is given to registered interested and affected parties regarding where the—*
 - i. *revised documents as contemplated in regulation 19(1)(b);*
 - ii. *revised documents as contemplated in regulation 23(1)(b); or*
 - iii. *environmental impact assessment report and documents as contemplated in regulation 21(2)(d);*

may be obtained, the manner in which and the person to whom representation on these reports or plans may be made and the date on which such representations are due.

Subregulation 5 is not applicable to the project, as the Application is being undertaken in terms of the requirements of requirements of GNR 267 of 2017 as per the National Environmental Management Act, 1998 (Act No. 107 of 1998).

- 6) *When complying with this regulation, the person conducting the public participation process must ensure that—*
- a) *information containing all relevant facts in respect of the application or proposed application is made available to potential interested and affected parties; and*
 - b) *participation by potential or registered interested and affected parties is facilitated in such a manner that all potential or registered interested and affected parties are provided with a reasonable opportunity to comment on the application or proposed application.*

All relevant facts in respect of the S24G application, will be made available to potential I&APs. Both the Scoping Report and the Environmental Impact Assessment Report with the Environmental Management Programme Report will be made available for public review and comment for a period of 30 days each.

- 7) *Where an environmental authorisation is required in terms of these Regulations and an authorisation, permit or licence is required in terms of a specific environmental management Act, the public participation process contemplated in this Chapter may be combined with any public participation processes prescribed in terms of a specific environmental management Act, on condition that all relevant authorities agree to such combination of processes.*

As this is an integrated application, namely an environmental authorisation and waste licence application in terms of the NEMA, it is proposed to combine the public participation process with all notification documentation and other public participation opportunities referring to all three authorisation/permit or licence.

4.5.5 SECTION 42: REGISTER OF INTERESTED AND AFFECTED PARTIES

4.5.5.1 INTERESTED AND AFFECTED PARTY (I&AP) DATABASE

A proponent or applicant must ensure the opening and maintenance of a register of interested and affected parties and submit such a register to the competent authority, which register must contain the names, contact details and addresses of—

- a) *all persons who, as a consequence of the public participation process conducted in respect of that application, have submitted written comments or attended meetings with the proponent, applicant or EAP;*
- b) *all persons who have requested the proponent or applicant, in writing, for their names to be placed on the register; and*
- c) *all organs of state which have jurisdiction in respect of the activity to which the application relates.*

As part of the PPP, an I&AP database has been developed and will be continuously updated for the project. A copy of the database to date is included as Appendix D4 of the Scoping Report.

4.5.6 SECTION 43: REGISTERED INTERESTED AND AFFECTED PARTIES ENTITLED TO COMMENT ON REPORTS AND PLANS

4.5.6.1 INTERESTED AND AFFECTED PARTIES AND COMMENTING AUTHORITIES

- 43) 1). *A registered interested and affected party is entitled to comment, in writing, on all reports or plans submitted to such party during the public participation process contemplated in these Regulations and to bring to the attention of the proponent or applicant any issues which that party believes may be of significance to the consideration of the application, provided that the interested and affected party discloses any direct business, financial, personal or other interest which that party may have in the approval or refusal of the application.*
- 2) *In order to give effect to section 240 of the Act, any State department that administers a law relating to a matter affecting the environment must be requested, subject to regulation 7(2), to comment within 30 days.*

Stakeholders who are captured/registered on the database for the project shall include the following:

- The owners or persons in control of the land where the proposed mining is to be undertaken (if different than applicant);
- The occupiers of the property where the development is to be undertaken;
- The owners and occupiers of land adjacent to the mining area;
- Provincial and local government (relevant local and district municipalities);
- Organs of state, other than the authorising authority, such as the Department of Agriculture, Forestry and Fisheries (DAFF – now grouped with Environmental Affairs, forming DFFE since March 2021) or Department of Roads, having jurisdiction in respect of any aspect of the proposed project;
- Relevant residents' associations, rates payers' organisations, community-based organisations and NGOs;
- Environmental and water bodies, forums, groups and associations; and
- Private sector (business, industries) in the vicinity.

4.5.6.2 DECISION MAKING AUTHORITIES IN TERMS OF THE ENVIRONMENTAL AUTHORISATION AND WATER USE LICENCE

The decision-making authorities includes the:

- Department of Mineral Resources and Energy (DMRE); and
- Department of Water and Sanitation (DWS) – (Water Use License).

I&APs who attend any public open days and /or submitted contact details will be registered on the I&AP database. The database will be updated on an on-going basis throughout the process and included as an Appendix to the Scoping Report and the Environmental Impact Assessment Report.

4.5.6.3 PUBLIC REVIEW OF THE DRAFT SCOPING REPORT

The DSR will be placed out for public review for a period of 30 days from **24 February 2023** to **27 March 2023**, at the following locations:

All registered stakeholders and authorising/commenting state departments will be notified of the public review period as well as the location of the DSR via email and bulk SMS. The abovementioned plan, for notification and provision of reports, will also be utilised for the review of the EIAR once the EIAR Phase has commenced.

4.5.7 SECTION 44: COMMENTS OF INTERESTED AND AFFECTED PARTIES TO BE RECORDED IN REPORTS AND PLANS

- 1) *The applicant must ensure that the comments of interested and affected parties are recorded in reports and plans and that such written comments, including responses to such comments and records of meetings are attached to the reports and plans that are submitted to the competent authority in terms of these Regulations.*
- 2) *Where a person desires but is unable to access written comments as contemplated in subregulation (1) due to-*
 - a. *a lack of skills to read or write;*
 - b. *disability; or*
 - c. *any other disadvantage;*

reasonable alternative methods of recording comments must be provided for.

All comments and responses will be included in the Comments and Response Report (CRR) and comments received to date have been included in Appendix D4 of this DSR.

4.5.7.1 PUBLIC MEETINGS AND OPEN DAYS

Public open day can be schedule if required by I&APs. The purpose of public meetings during the Scoping Phase is to introduce the project and to get the potential Interested and Affected parties (I&APs) to register, as well as raise any concerns or issues that the I&APs may have with regards to the proposed Millsell-Waterkloof Opencast Mine Project. Notes of the public open day will be included in the Final Scoping Report as an Appendix.

Alternatively Zoom or Skype, and/or phone calls with landowners and other I&APs can be undertaken.

4.5.7.2 SUMMARY OF ISSUES RAISED BY I&APS FROM PUBLIC PARTICIPATION

All concerns, comments, viewpoints and questions (collectively referred to as 'issues' have been documented and responded to adequately in the CRR, which will be attached in the FSR. The CRR records the following:

- List of all issues raised;
- Record of who raised the issues;
- Record of where the issues were raised;
- Record of the date on which the issue was raised; and
- Response to the issues.

5 PROJECT DESCRIPTION

5.1 DESCRIPTION OF THE PROPERTY

The Samancor Chrome Limited Waterkloof Section falls within the responsibility of Samancor WCM and lies within the jurisdiction of the Bojanala Platinum District Council and the Rustenburg Local Municipality in the North West Province. Figure 3 below indicates the location of the Waterkloof Section on which opencast mining has been undertaken.

The distance from the Waterkloof Section to the neighbouring towns of Rustenburg and Kroondal are 4.3 km and 1.9 km respectively.

There are several informal settlements in and around the towns of Rustenburg and Kroondal. The nearest town to the study area is the informal settlement near Kroondal (located approximately 1.9 km from the Waterkloof Section).

Table 5: Description of the property

Farm Name:	The opencast activities have been undertaken on: <ul style="list-style-type: none"> • Portion 146 of the farm Waterkloof 305 JQ 			
Magisterial district:	Bojanala Platinum District Council and the Rustenburg Local Municipality			
21 digit Surveyor General Code for each farm portion	Farm	Portion	Title Deed	Surveyor General Code
	WK305JQ	PTN 146	T44690/1998	T0JQ0000000030500146

5.2 LOCALITY MAP

(Show nearest town, scale not smaller than 1:250000 attached as Appendix B).

Figure 3 indicates the regional location of the Waterkloof Opencast Area. The locality map is also appended in Appendix B.

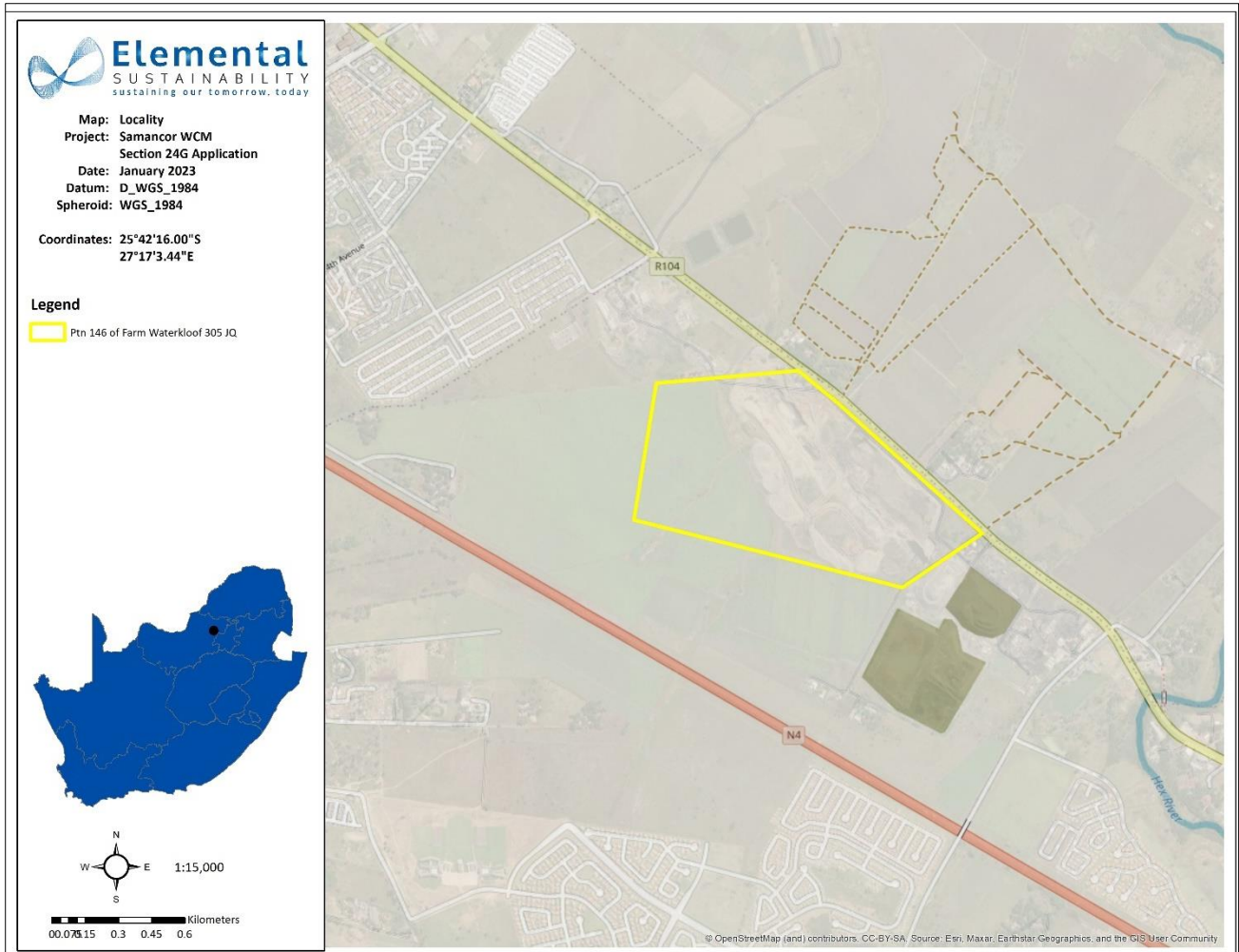


Figure 3: Regional Locality of the Waterkloof Opencast Area

5.3 THE MINERAL RESOURCE

The Millsell Section is situated in the North West Province in the Magisterial District of Rustenburg on the farms Waterkloof 305 JQ, Waterval 306 JQ, Waterval 307 JQ, Kroondal 304 JQ and Waterval 303 JQ as shown on the locality plan - Figure 1, and Mining Right plan – Figure 2.

The mineral currently being mined at Millsell is chromite and in particular the LG6 and LG6A chromitite seams. Converted Mining Right NW30/5/1/2/2/236 MR over the farms Waterkloof 305 JQ, Waterval 306 JQ, Waterval 307 JQ, Kroondal 304 JQ and Waterval 303 JQ includes the minerals associated with the mining of chromitite ore, more specifically including platinum, palladium, rhodium, ruthenium, iridium and osmium, gold, silver, copper, nickel and cobalt, which may be extracted from normal mining of Chromite in the Middle Group (MG) and Lower Group (LG) seams. Figure 4 illustrates the regional geology of the Bushveld Complex (BC) in relation to the Rustenburg Layered Suite and major settlements.

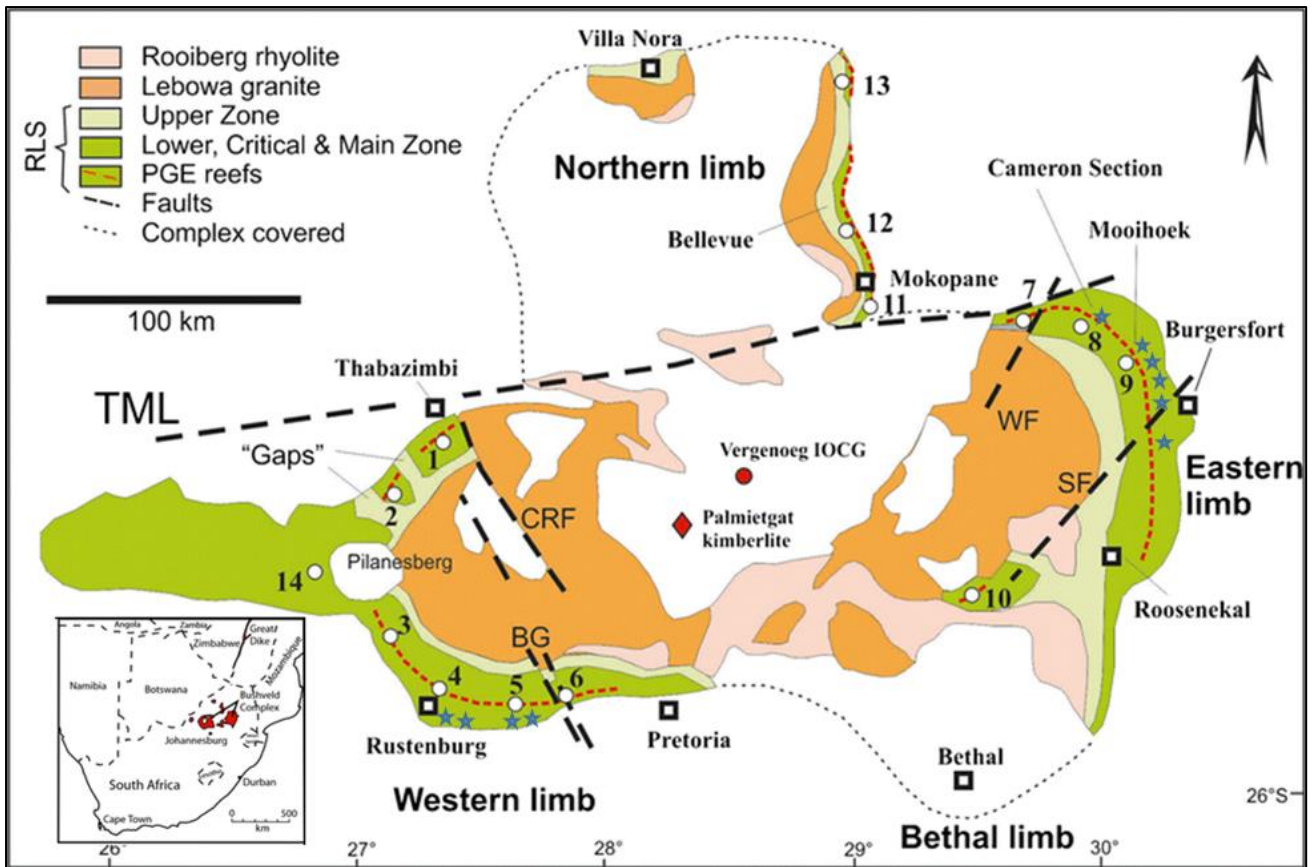


Figure 4: Regional Geology and regional map of the BC

The ultramafic/mafic rocks of the BC are collectively known as the Rustenburg Layered Suite (RLS) and have been subdivided, from base to top, into five zones, known as the Marginal, Lower, Critical, Main and Upper Zones. The general sequence and composition of the different zones is shown in Figure 4. The location of Millsell mine in relation to the RLS sequence outcrops is illustrated in Figure 4.

The continuity of the Critical Zone is intermediate between that of the Lower Zone and Main-Upper Zones. The Critical Zone is the host to all chromium and PGM mineralisation within the BC.

The igneous layering within the Critical Zone is remarkably uniform over much of the BC, with individual layers traceable for tens to hundreds of kilometres. It may be subdivided into lower and upper sections with cyclic units consisting of chromitite, pyroxenite, norite and anorthosite. Cycles in the Lower Critical Zone are entirely ultramafic in character. Cycles in the Upper Critical Zone comprise ultramafic lithology and also norite-anorthosite.

Chromitite layers occur throughout the Critical Zone, usually, but not always, at the base of crystallisation cycles. The chromitite seams have been classified into lower, middle and upper groups, with the Lower Group occurring in the Lower Critical Zone and the Upper Group in the Upper Critical Zone. The Middle Group chromitite seams straddle the boundary between lower and upper divisions of the Critical Zone. The chromitite seams are named according to their location within the layered succession, with numbers commencing from the bottom up, with the lowermost group being named LG1, followed by LG2, LG3, etc. in the Lower Group (consisting of 7 layers),

progressing to MG0, MG1, MG2, etc. (consisting 4 layers) in the Middle Group, and then on two layers in the Upper Group, UG1 and UG2. The thickness of these chromitite layers ranges from several millimetres to several metres and named chromitite layers may comprise multiple, composite layers of chromitite separated by interlaminated silicate rocks.

The target area of this application is underlain by rocks of the Lower Critical Zone and Upper Critical Zone of the BC, consisting of chromitite interlayered with pyroxenite, norite, anorthositic norite, and mottled anorthosite.

5.3.1.1 MINERAL RESOURCE MAPS

The mineral resources of the chromitite seams present in the Millsell Section are shown in table 5 below. As can be seen there is little variability in the quality of the chromitite seams. The underground mineral resources of the entire Millsell operation consisting of all three converted mining rights:

- NW 30/5/1/2/2/260MR,
- NW 30/5/1/2/2/236MR,
- NW 30/5/1/2/2/479MR.

The underground resources, comprising of LG6 and LG6A chromitite seams (ANNEXURE C), amounts to 10Mt of chromite and includes all three categories of resources (measured, indicated and inferred).

The Life of Mine (LOM) for the underground mine is estimated to be 5.9 years, based on an in-situ Mineral Resource of 9.98Mt at a planned production rate of 1.134Mt per year. The LOM for the opencast resource is estimated to be 12 years, based on an In Situ Mineral Resource of 13.96Mt, mined at a production rate of 1.134 Mt per year.

Table 6: Millsell Section WCM- Mineral Resources – Converted Mining Right NW 30/5/1/2/2/260MR, NW 30/5/1/2/2/236MR and NW 30/5/1/2/2/479MR as at 31 December 2019

Samancor Western Chrome Mines - Mineral Resources as at 31 December 2019 - Consolidated Mining Right: NW30/5/1/2/2/236MR									
Farm	Classification	In Situ (MT)	Seam Width (m)	Area (Ha)	Cr2O3	FeO	SiO2	Cr:Fe Ratio	
Farm: Waterkloof 305JQ 260MR									
LG6 & LG6A (0-600m)	Indicated	0.02	1.16	0.47	42.30	24.25	5.30	1.53	
	Measured	0.76	1.17	15.35	42.20	24.28	5.39	1.53	
260MR Waterkloof 305JQ Weighted Averages		0.78	1.17	15.82	42.20	24.28	5.38	1.53	
Farm: Kroondal 304JQ 260MR									
LG6 & LG6A (0-600m)	Inferred	0.05	1.18	0.96	43.36	24.21	4.22	1.57	
	Indicated	1.33	1.22	25.31	43.55	24.37	4.01	1.57	
	Measured	0.66	1.21	12.89	43.41	24.19	4.02	1.58	
260MR Kroondal 304JQ Weighted Averages		2.04	1.21	39.16	43.50	24.31	4.02	1.57	
260MR Total Weighted Averages		2.82	1.20	54.98	43.14	24.30	4.40	1.56	
Farm: Waterval 306JQ Underground 236MR									
LG6 & LG6A (0-600m)	Indicated	0.20	1.32	4.31	40.86	24.08	6.82	1.49	
	Measured	0.53	1.23	10.48	41.42	24.17	6.31	1.51	
236MR Waterval 306JQ Underground Weighted Averages		0.72	1.26	14.79	41.27	24.15	6.45	1.50	
Farm: Waterval 306JQ Opencast 236MR									
MG1 (0-25m)	Inferred	0.21	0.69	7.38	38.68	23.88	7.52	1.42	
MG2 (0-30m)	Inferred	0.13	0.51	6.91	35.97	23.83	8.94	1.31	
MG3 (0-25m)	Inferred	0.33	1.11	8.10	33.31	22.88	11.55	1.27	
MG4 (0-65m)	Inferred	1.74	1.10	40.07	32.89	22.64	12.08	1.25	
MG4A (0-65m)	Inferred	1.55	1.10	39.38	32.09	22.28	15.23	1.25	
236MR Waterval 306JQ Opencast Weighted Averages		3.96	1.06	101.85	33.02	22.62	12.93	1.26	
Farm: Waterkloof 305JQ Underground 236MR									
LG6 & LG6A (0-600m)	Inferred	0.28	1.15	6.01	42.12	23.39	4.66	1.59	
	Indicated	0.90	1.08	20.14	42.22	23.40	4.74	1.59	
	Measured	2.79	1.14	59.33	42.71	23.91	4.98	1.57	
236MR Waterkloof 305JQ Underground Weighted Averages		3.98	1.13	85.48	42.56	23.76	4.90	1.57	
Farm: Waterkloof 305JQ Opencast 236MR									
LG5 (0-35m)	Inferred	0.16	0.43	8.98	40.14	22.44	7.54	1.57	
LG6 (0-30m)	Inferred	0.32	0.96	7.87	42.42	24.04	5.19	1.55	
LG6A (0-30m)	Inferred	0.09	0.26	7.87	42.27	24.11	5.38	1.54	
MG1 (0-25m)	Inferred	0.63	0.69	22.25	39.62	24.04	6.50	1.45	
MG2 (0-30m)	Inferred	0.54	0.47	28.32	36.99	23.85	8.64	1.35	
MG3 (0-25m)	Inferred	1.37	1.04	33.54	33.32	23.02	12.24	1.26	
MG4 (0-65m)	Inferred	3.66	1.11	84.41	33.61	23.30	11.67	1.26	
MG4A (0-65m)	Inferred	3.23	1.00	81.88	33.66	23.21	13.17	1.26	
236MR Waterkloof 305JQ Opencast Weighted Averages		10.00	0.98	275.13	34.61	23.33	11.42	1.30	
236MR Total Underground Weighted Averages		4.70	1.15	100.27	42.36	23.82	5.14	1.56	
236MR Total Opencast Weighted Averages		13.96	1.00	376.98	34.16	23.13	11.85	1.29	
236MR Total Weighted Averages		18.65	1.04	477.25	36.22	23.30	10.16	1.36	
Farm: Waterval 303JQ Underground 254MR									
LG6 & LG6A (0-600m)	Indicated	0.34	1.09	7.19	42.13	22.11	4.83	1.45	
	Measured	0.33	1.06	7.25	42.76	22.42	4.65	1.47	
254MR Waterval 303JQ Weighted Averages		0.68	1.07	14.43	42.44	22.26	4.74	1.46	
Farm: Kroondal 304JQ Underground 254MR									
LG6 & LG6A (0-600m)	Inferred	0.15	1.13	3.16	42.35	23.95	5.04	1.59	
	Indicated	0.58	1.10	12.15	42.66	24.08	4.73	1.58	
	Measured	0.92	1.11	19.29	42.53	24.06	4.59	1.57	
254MR Kroondal 304JQ Weighted Averages		1.65	1.11	34.60	42.56	24.06	4.68	1.58	
Farm: Waterkloof 305JQ Underground 254MR									
LG6 & LG6A (0-600m)	Indicated	0.12	1.04	2.89	42.24	23.78	5.18	1.56	
	Measured	0.00	1.07	0.12	42.58	24.14	5.16	1.55	
254MR Waterkloof 305JQ Weighted Averages		0.13	1.04	3.01	42.25	23.79	5.18	1.56	
254MR Total Weighted Averages		2.46	1.10	52.04	42.51	23.55	4.72	1.54	
Combined Total weighted average		23.93	1.06	584.27	37.68	23.44	8.92	1.40	
Total Underground tonnes in situ		9.98							
Total Opencast tonnes in situ		13.96							

5.4 DESCRIPTION OF THE ACTIVITIES UNDERTAKEN

Samancor commenced opencast mining and related activities on Portion 146 of the farm Waterkloof 305 JQ in May 2021. All the activities conducted as listed below have been undertaken within Samancor's WCM Waterkloof existing mine right and need to be regularised as per the Section 24G process:

- Opencast Mining;
- Overburden Dumps;
- Topsoil Dumps
- Offices;
- Parking Area;
- Workshop;
- Access Haul Roads;
- ROM Pad
- Hard Park; and
- Security Entrance.

Samancor commenced opencast mining and related activities on Portion 146 of the Farm Waterkloof 305 JQ in May 2021. Refer to the layout plan of the opencast mine and related activities in Figure 5 below.

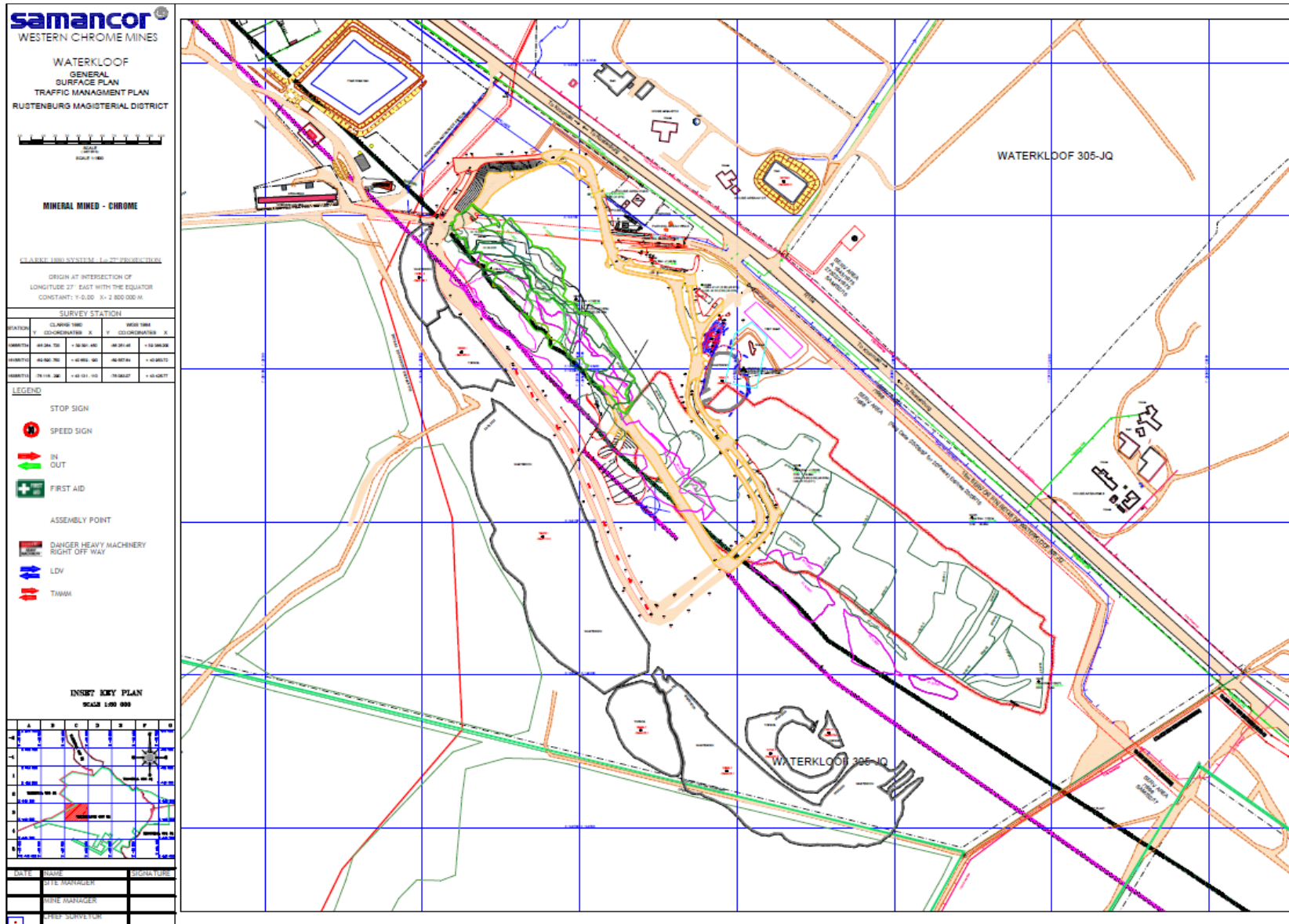


Figure 5: Infrastructure and layout plan

5.4.1 OPENCAST MINING METHOD

The ore outcropping on surface below topsoil was mined by opencast method due to the shallow nature of ore and to make the ore available as early as possible. Mining operations were 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 back actor/excavators and hauling with dump trucks. A safe high wall height pending economic viability for the opencast mining method will be applied.

The cleared area for opencast mining is indicated in the table below:

Corners of Opencast Mine	Latitude	Longitude
Corner 1	25°42'18.86"S	27°17'6.03"E
Corner 2	25°42'18.54"S	27°17'3.50"E
Corner 3	25°42'11.35"S	27°16'57.29"E
Corner 4	25°42'9.85"S	27°17'0.52"E

Samancor Chrome is currently undertaking rehabilitation over the area of concern which is approximately 49 Ha. The mine is currently busy with concurrent (roll over) backfilling and revegetation of the extent of the disturbed area. The coordinates of the area that has been rehabilitated to date are provided below.

Area 1

Corners of Rehabilitated Area	Latitude	Longitude
Corner 1	25°42'11.37"S	27°16'56.83"E
Corner 2	25°42'13.36"S	27°16'55.74"E
Corner 3	25°42'22.83"S	27°17'5.70"E
Corner 4	25°42'21.41"S	27°17'7.06"E

Area 2

Corners of Rehabilitated Area	Latitude	Longitude
Corner 1	25°42'24.42"S	27°17'10.70"E

Corner 2	25°42'26.41"S	27°17'9.33"E
Corner 3	25°42'33.28"S	27°17'24.46"E
Corner 4	25°42'36.26"S	27°17'21.60"E

5.4.2 INFRASTRUCTURE AND ACTIVITIES ESTABLISHED ON SITE

Topsoil stockpile has been established on site. The area for the topsoil stockpile has a capacity of 156 888m³. It covers an area of approximately 43 545m. The topsoil stockpile is 8.96m. The coordinates of the topsoil stockpile are provided in the table below:

Corners of Topsoil Stockpile	Latitude	Longitude
Corner 1	25°42'30.66"S	27°17'4.21"E
Corner 2	25°42'34.15"S	27°17'5.54"E
Corner 3	25°42'34.02"S	27°17'3.20"E
Corner 4	25°42'31.51"S	27°17'2.33"E

Two waste rock dumps (WRD) have been established on site. WRD1 has a capacity of 274202.81m³. It covers an area of approximately 3.22 ha. WRD2 has a capacity of 3884.91m³. It covers an area of approximately 1.33 ha. The coordinates of the waste rock, overburden dumps are provided in the table below:

Corners of Waste Rock Dump	Latitude	Longitude
Waste Rock Dump 1		
Corner 1	25°42'21.17"S	27°16'56.35"E
Corner 2	25°42'20.24"S	27°16'58.99"E
Corner 3	25°42'29.59"S	27°17'3.88"E
Corner 4	25°42'30.33"S	27°17'0.78"E
Waste Rock Dump 2 (smaller dump – east of Topsoil SP)		
Corner 1	25°42'31.08"S	27°17'5.57"E

Corner 2	25°42'36.43"S	27°17'11.31"E
Corner 3	25°42'36.77"S	27°17'8.88"E
Corner 4	25°42'31.72"S	27°17'4.76"E

A Run of Mine (ROM) stockpile area has been established on site. The actual ROM Pad covers an area of 1.32 hectares and has a capacity of 26 491m³. The monthly ROM is \pm 20 000t per month. The coordinates of the ROM Pad area:

- Latitude: 25°42'23.01"S
- Longitude: 27°17'11.05"E

The entire ROM stockpile area coordinates are provided in the table below.

Corners of ROM Stockpile Area	Latitude	Longitude
Corner 1	25°42'20.48"S	27°17'8.02"E
Corner 2	25°42'19.52"S	27°17'10.06"E
Corner 3	25°42'22.90"S	27°17'12.08"E
Corner 4	25°42'23.82"S	27°17'10.62"E

Haul roads have been established on site. These haul roads are 3.037 KM long and 18 m wide. The start and end coordinates of the haul roads are provided below:

Haul Roads	Latitude	Longitude
Haul Road 1		
Start	25°42'13.53"S	27°17'6.98"E
End	25°42'29.29"S	27°17'4.42"E
Haul Road 2		
Start	25°42'30.35"S	27°17'5.12"E
End	25°42'34.76"S	27°17'16.63"E

The mining site is accessed from the R104 at the following coordinates:

- Longitude: 25°42'12.93"S
- Latitude: 27°17'7.96"E

A temporary office and workshop area has been established on site, together with a hard park area. The size of this area is ±0.24ha. The co-ordinates for the area are indicated below:

Corners of ROM Stockpile	Latitude	Longitude
Corner 1	25°42'15.71"S	27°17'9.64"E
Corner 2	25°42'17.79"S	27°17'11.39"E
Corner 3	25°42'18.48"S	27°17'9.79"E
Corner 4	25°42'16.58"S	27°17'8.87"E

6 NEED AND DESIRABILITY OF THE ACTIVITIES

The main benefits of the Waterkloof Opencast Mine Project are:

- Direct economic benefits will be derived from wages, taxes and profits;
- Indirect economic benefits will be derived from the procurement of goods and services and the spending power of employees;
- Provision of continued employment opportunities to employees already skilled within the area.
- Continued implementation of the project will result in skills development associated with mining;
- It will contribute to the upliftment of living standards and the health and safety of the local community;
- The project will result in continued economic mining of a known resource;
- Reduction in illegal mining and unregulated mining.

The project is aligned with the objectives of the MPRDA (Act 28 of 2002):

- To promote economic growth and mineral development in the Republic;
- To promote employment and advance the social and economic welfare of all South Africans;
- To ensure that the nation's mineral resources are developed in an orderly and ecologically sustainable manner while promoting justifiable social and economic development; and
- To ensure that mining developments contribute towards the social-economic development of the area in which they are operating.

6.1 NO-GO ALTERNATIVE

The no-go alternative is the option of not receiving authorisation for the activities conducted. The following negative impacts would result:

- There will be no economic boost in the region which would have fed into the industrial sector; and
- The anticipated job and skills development opportunities and employment the project presents will not be generated.

7 THE ENVIRONMENTAL ATTRIBUTES ASSOCIATED WITH THE SITE: BASELINE ENVIRONMENT

The description of the baseline receiving environment (on site and surrounding) was obtained from the studies undertaken by the specialist team from existing documentation as part of the original IWWMP (2019), as well as the Mining Works Programme, the Basic Assessment Report (BAR) and EMPr Report (2018) for the WCM Millsell and Waterkloof Sections.

7.1 TOPOGRAPHY

The area is situated on the northern slopes of the Magaliesberg and adjacent low-lying areas to the north, is very effectively sheltered by the extensive highveld plateau and the Magaliesberg Mountain.

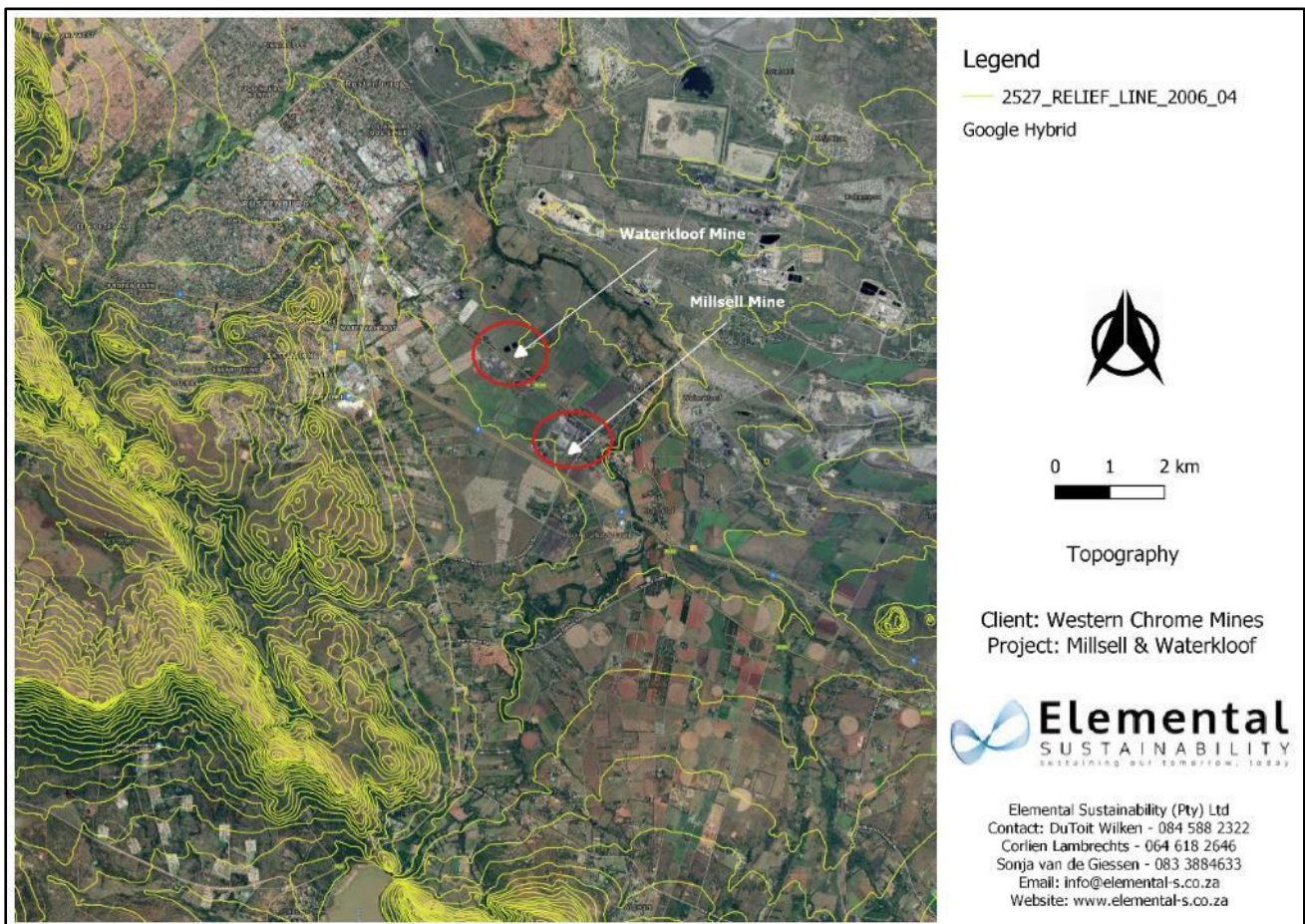


Figure 6: Topography of Millsell and Waterkloof Mines

7.2 GEOLOGY

7.2.1 GEOLOGICAL SETTING

Millsell is situated on the RLS of the BIC. Predominant norite and anorthosite underly the site with interlayers of anotherite and a layer of pyroxenite at the top. The mineral currently being mined at Millsell is chromite and in particular the LG6 and LG6A chromitite seams.

7.2.2 REGIONAL GEOLOGY

The chromitite seams occur throughout the Critical Zone. These seams are further divided into the Lower, Middle and Upper Group chromitite seams. The Lower Critical Zone is further subdivided into a lower and an intermediate critical zone (ICZ). All the Lower Group (LG) chromitite seams occur within the pyroxenites of the Lower Critical Zone. The Middle Group (MG) chromitite layers occur at the transition from the Lower to the Upper Critical zone. In the Western limb of the BIC, the Lower Group contains seven chromitite seams, the Middle Group seven and the Upper Group two chromitite seams.

At Western Chrome Mines (WCM), ore containing chrome and the Associated Minerals is being produced from the Lower Group (LG), particularly the LG6 and LG6A chromitite seams at Millsell Section and in future from the Middle Group chromitites (MG) in Opencast Mining. Figure 7 below illustrates the generalized stratigraphy of WCM at Millsell Mine.

7.2.3 LOCAL GEOLOGY

Previous and current exploration activities at the Millsell Section include the intersection of the Lower Group chromitite layers (LG6/LG6A) and Middle Group Chromitite layers (MG1 to MG4) in 134 diamond drill boreholes, as well as helicopter borne geomagnetic surveys. The exploration was done on the Converted Mining Right No. NW30/5/1/2/2/236MR, NW30/5/1/2/2/260MR, NW30/5/1/2/2/479MR and NW30/5/1/2/2/254MR on Millsell Section of WCM.

Millsell Mine will in future extract the LG5, LG6, LG6A, MG1, MG2, MG3, MG4 and MG4A chromitite seams in opencast mining in addition to underground operations on the LG6 and LG6A and MG1 to MG4A. The total in situ mineral resources in the 0-600 m depth of the LG6 and LG6A seams at Millsell section amounts to 9.98 Mt. The LG6 package has a Cr₂O₃ content of 42.62 and Cr: Fe ratio of 1.56.

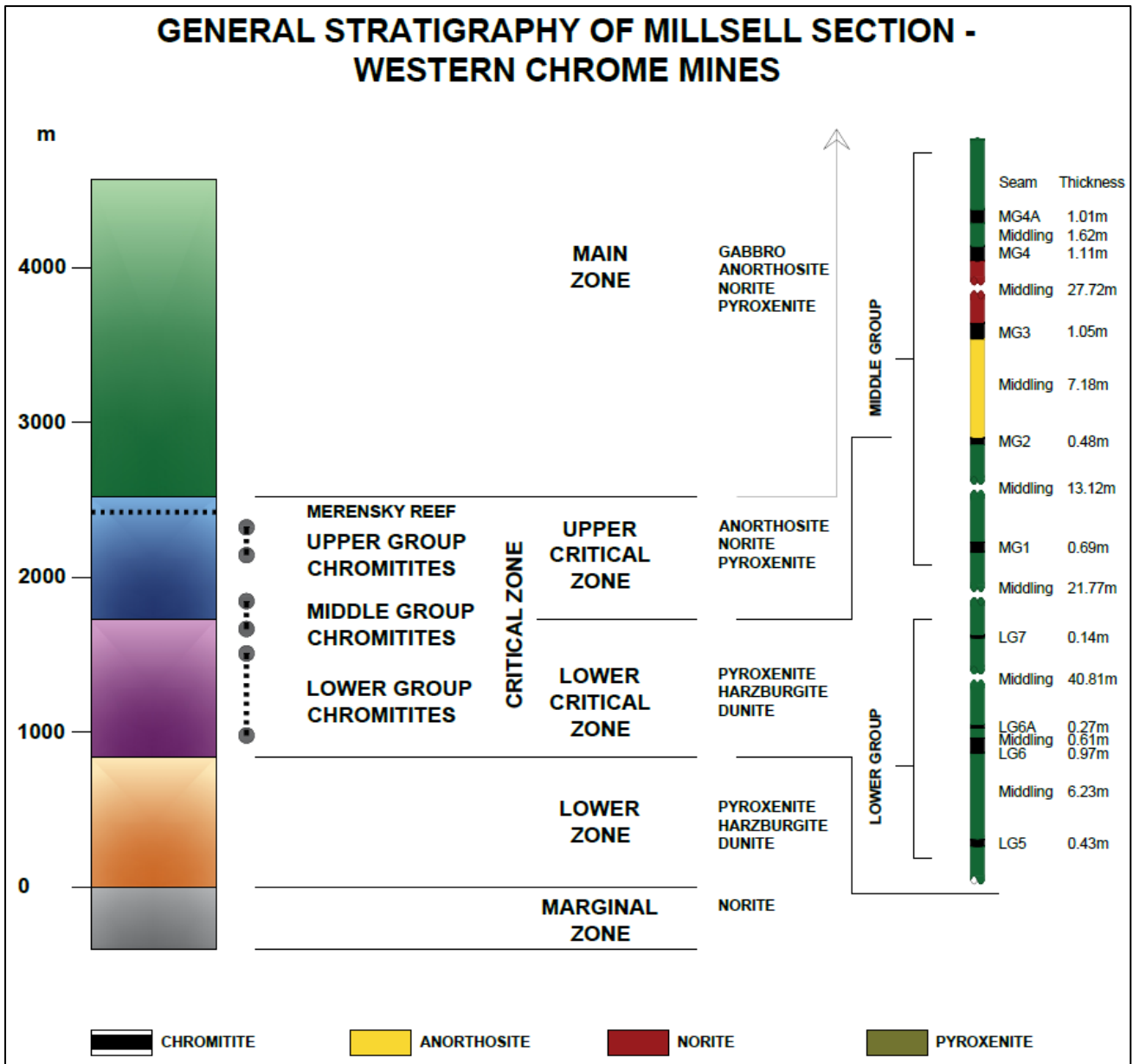


Figure 7: Generalized Stratigraphic column of the BIC at WCM

The predominant rock types that occur in the Millsell area are anorthosite, norite, pyroxenite and chromitite. The host rock type that contains the Lower chromitite seams is mainly pyroxenite. The surface area is mostly covered by black vertisolic clay locally referred to as ‘turf’. The rocks of the Critical, Lower and Marginal Zones of the RSL outcrop here and occur below the turf.

7.2.4 STRUCTURAL GEOLOGY

The RLS has been dissected by faults and intruded by numerous NW – SE trending dolerite dykes. The suite has also been intruded by a syenite ring, the Pilanesberg Syenite Ring on which the Madikwe Game Park and Sun City are located.

Minor faulting occurs throughout the Millsell Section, with north-south trending normal faults and east-west trending reverse faults. A major fault trending north-south to the east of the Millsell Section, with a downward displacement to the east, has a scissor effect northward with a downward displacement to the west, and peters out further northwards. This fault splays out into a northwest-southeast 5 m eastern downward displacing step fault.

A major dyke trending west-northwest is situated to the north of the mining area dipping in a southerly direction at an angle of approximately 70°. The thickness of the dyke is in the order of 10 to 15 meters as determined from geophysical modelling, underground prospect drilling and geological mapping of mining faces. Multiple thin intrusions, striking sub-parallel to the major intrusion direction, bisect underground workings at Millsell mine.

7.3 CLIMATE

The project area is situated on the northern slopes of the Magaliesberg and adjacent low-lying areas to the north, is very effectively sheltered by the extensive Highveld plateau and the Magaliesberg Mountain. The project site is situated within the Highveld climatic zone and the main features is a warm temperate climate, annual average precipitation of 600 – 900 mm/year consisting mainly of thunderstorms in the summer months.

The area, in which the water catchment area is found, is characterised by a flat topography with undulating areas. The climate of the catchments is generally semi-arid and the temporal and spatial variability of the rainfall varies. The natural mean annual runoff (MAR) of the Crocodile (West) Marico WMA is 855 million m³/annum. Approximately 75% of the total surface runoff from the WMA flows down the Crocodile River, while the Marico catchment contributes 20% and the Upper Molopo catchment 5%.

7.3.1 TEMPERATURE

The average daily maximum temperature is roughly 27°C in January and 17°C in July but may rise to 38°C and 26°C respectively. Average daily minima range from about 13°C in January to 0°C in July, whereas extremes can sink to 1°C and -13°C respectively. The period during which frost is likely to form lasts on the average for about 120 days from May to September. Sunshine duration in summer is about 60% and in winter about 80% of the time.

Table 7: Minimum and maximum temperatures (0°C) for the project area

Month	Average daily maximum temperature (°C)	Average daily minimum temperature (°C)
January	31.8	17.4
February	30.8	18.7
March	29.6	14.3
April	29.1	12.8
May	25.0	6.5
June	20.1	4.4
July	21.8	1.7
August	23.7	7.4
September	27.2	9.2

Month	Average daily maximum temperature (°C)	Average daily minimum temperature (°C)
October	30.1	13.4
November	30.5	14.8
December	29.7	17.3

7.3.2 PRECIPITATION AND EVAPORATION

The winter months are normally dry as about 85% of the annual rainfall falls in the summer months, rain of 124 mm to 150 mm have been recorded to fall within one day. This region has about the highest hail frequency in South Africa as 4 to 7 occurrences may be expected annually at any one spot. Refer to Table 8 for the minimum, average and maximum rainfall.

Table 8: Rainfall within the project area

Rainfall (mm)	2015	Minimum	Average	Maximum	2017
January	75.7	0	150.46	366.7	136.7
February	59.9	0	118.08	290	154.8
March	53.3	0	90.15	293.8	7.4
April	16.5	0	47.61	246.2	20.3
May	0	0	16.84	167.7	10.4
June	0	0	7.27	54.5	0
July	0	0	2.45	28.3	1.4
August	0	0	7.49	60.8	0.4
September	58	0	22.58	178	4.1
October	ND	0	59.43	164.2	44.4
November	ND	20.7	95.98	249.4	118.8
December	ND	0	117.59	332.6	158.9
Annual	263.4	263.4	714.41	1,121.2	657.6

Potential A-pan evaporation figures for the area exceed the rainfall in the area indicating the level of water deficiency in the area. The monthly evaporation figures can be seen in Table 9. A-pan, and S-pan Evaporation data is indicated in Table 9 and Table 10.

Table 9: A-pan evaporation (mm)

Month	A-pan evaporation (mm)	Month	A-pan evaporation (mm)
January	199	July	157
February	214	August	129
March	210	September	141
April	204	October	113
May	250	November	115
June	193	December	155

Table 10: S-Pan Evaporation

S-Pan	2015	Minimum	Average	Maximum
January	155.2	68.6	157.10	213.4
February	137.4	94.7	137.94	198.7
March	143.2	87.4	121.18	174.2
April	111	58	94.10	139
May	99	57.4	82.39	161.6
June	69	49	65.48	109.1
July	ND	51.8	73.91	128.8
August	91	65	103.49	138.5
September	143	87.1	137.18	165.1
October	ND	118	157.85	189.4
November	ND	91.9	157.69	221.4
December	ND	76	162.53	229.8
Annual	948.8	948.8	1434.84	1,740.2

7.3.3 MEAN ANNUAL RUNOFF

The MAR for the A22H catchment is indicated in Table 11. The hydrology for the site is based on the nearest rainfall station, which is Rustenburg SAWB (South African Weather Bureau) No. 0511400W) and is located approximately 8 km to the north-west.

Table 11: Mean Annual Runoff information for the A22H catchment

Aspect	Value	Aspect	Value
Gross area (km ²)	579	MAE (Mean Annual Evaporation) (mm)	1700
Net area (km ²)	579	MAP (Mean Annual Precipitation) (mm)	658
Irrigation area (km ²)	0.8	MAR (mm)	24
Evaporation zone	3B	MAP-MAR Respectively	8
Rain zone	A2F	Net MAR (10 ⁶ m ³)	13.7
<i>km²: square kilometres</i>		Gross MAR (10 ⁶ m ³)	13.7

7.3.4 NORMAL DRY WEATHER FLOW

The mean dry season rainfall, May to September, is very small. It can be assumed that dry weather flow would be negligibly small. Dry weather flow in the in the Maretwana River will consist of the treated sewage effluent from the Millsell and Waterkloof Sewage Treatment Plant. With a mean dry season rainfall (May to September), which ranges from 5 to 17 mm and an average of 10.8 mm, the run-off would be negligibly small.

7.4 SURFACE WATER

The designated water authority is the North West Province Regional Office of the DWS located at Hartbeespoort, within the A22H quaternary catchment. Four main streams and their tributaries drain the area northwards to the low-lying areas where the whole drainage system enters the Crocodile River. These four streams include:

- The Crocodile itself (across the area of Brits),

- The Eland Spruit, and Sterkstroom River (across the area of Millsell and Waterkloof/Marikana); and
- The Hex River (across the area of Kroondal/Rustenburg).

7.4.1 WATER MANAGEMENT AREA

The study area falls within the Crocodile (West) Marico Water Management (WMA 3) area. The responsible water authority is the North West Province Regional Office of the DWS. However, the following are also applicable:

- Rand Water for domestic water use; and
- Olifantsnek Irrigation Board for agricultural allocations.

The sub-catchment area, which is under the influence of the mine, is shown in Figure 8.

The watercourse that could become affected by pollution emanating from both mine sections is that of the Hex River. Millsell and Waterkloof sections are situated on an altitude of about 1 160 meters above mean sea level (mamsl); according to the topographical map (2527CB). There is thus a natural downward slope towards the Hex River basin, which has an altitude of about 1 130 mamsl. Polluted water (if any) will therefore drain into a south-eastern direction. The Hex River (perennial) flows from Olifantsnek Dam, within an adjacent drainage basin lying to the south-west. The river then flows through cultivated agricultural land.

7.4.2 SURFACE WATER HYDROLOGY

The hydrographic basin of the area is almost entirely formed by the northern slopes of the Magaliesberg. As mentioned previously, four main streams and their tributaries drain the area northwards to the low-lying areas where the whole drainage system enters the Crocodile River. These four streams include:

- The Crocodile itself (across the area of Brits),
- The Eland Spruit, and Sterkstroom River (across the area of Millsell and Waterkloof/Marikana); and
- The Hex River (across the area of Kroondal/Rustenburg).

This entire drainage system cuts across, perpendicularly, the narrow and elongated strips of the geological, edaphic and vegetation formations of the area A22H (WRC Report No 298/1.2/94). Neither mine is located at the top of a watershed or at the origin of a river that will be affected by mining operations, although the close proximity of the Millsell mining section to the Hex River may be of significance. The affected catchment includes one main perennial stream, the Hex River flowing from south to north. Several non-perennial tributaries were identified in the southern and northern parts of the sub-catchment area.

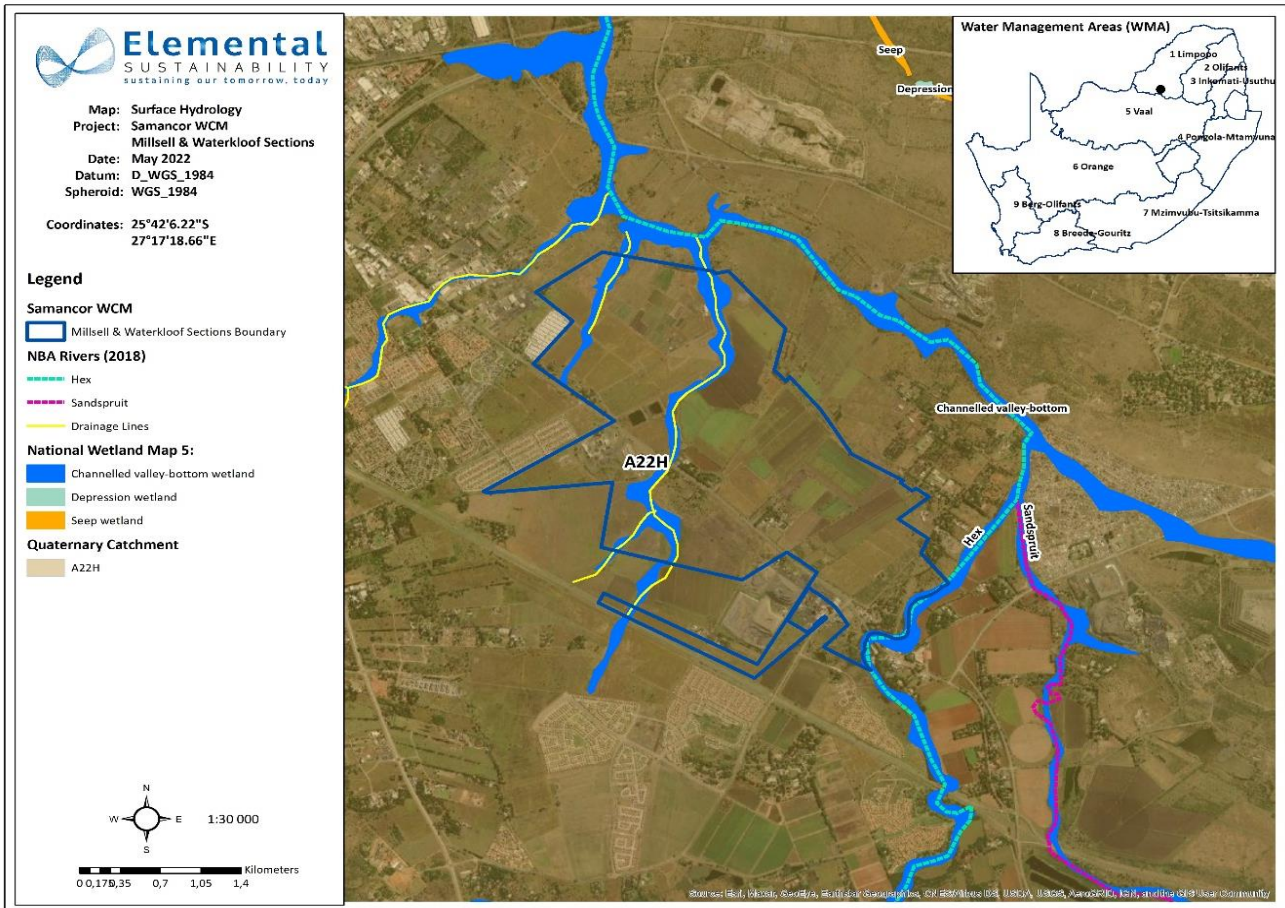


Figure 8: Surface Hydrology for the Waterkloof Opencast Mine

7.4.3 SURFACE WATER QUALITY

Surface water quality monitoring is conducted by Aquatico, on a monthly basis as required by the existing WUL.

7.4.4 RESOURCES CLASS AND RIVER HEALTH RECEIVING WATER QUALITY OBJECTIVES AND RESERVE

The Sub Quaternary Reach (SQR) associated with the monitoring points is the Maretlwana (SQR) A21K-1028. The reach is characterized by the following:

- The Reach spans an area of 29.02 km;
- The Present Ecological State (PES) has been rated Largely Modified (Class D);
- The Ecological Importance of the reach has been rated High; 11 species of fish are expected in the reach;
- The Ecological sensitivity is rated High with very high invertebrate responses to changes in physico-chemical parameters;
- The reach has one registered Freshwater NFEPA (Fish Support Area for *Enteromius motebensis*);
- Moderate instream modifications have been recorded in the reach; and
- Historic anthropogenic impacts recorded in the reach include:

- Low water crossings, Large dams, Overgrazing/trampling, Inundation, Runoff/effluent: Irrigation, Sedimentation (severity of impacts is small);
- Abstraction, Algal growth, Bed and Channel disturbance, Small (farm) dams, Erosion, Irrigation, Runoff/effluent: Urban areas, Urbanization, Vegetation removal (severity of impacts is medium); and
- Alien vegetation, Mining, Runoff/effluent: Mining (severity of impacts is large).

Table 12 provides a summary of the water resource classes and Table 13 provides the resources quality objectives for the Millsell and Waterkloof Sections.

Table 12: Summary of water resource classes per Integrated Unit of Analysis and Ecological Categories.

IUA	Class	Quaternary Catchment	Resource Unit	Ecological Category to be Maintained
3	III	A21J	3_1	C/D

Table 13: Resource Quality Objectives for the Millsell and Waterkloof Sections (DWS 2017).

IUA	Class	River	Resource Unit	Ecological Category	Component	Sub Component	RQO	Indicator	Numerical Unit		
3: CROCODILE/ROODEKOPJES	III	Crocodile River from outflow Hartebeespoort Dam to inflow Roodekopjes Dam, Rosespruit, Ramogatla and Kareespruit (A21J)	3_1	C/D	Quantity	Low Flows	EWR maintenance low and drought flows:	Base Flows Maintenance flows and drought flows (Intermediate EWR site on Crocodile River Monitoring at A2H083)		Maintenance Low flows (m³/s)	Drought flows (m³/s)
							Oct		1.425	1.446	
							Nov		1.591	1.607	
							Dec		1.690	1.703	
							Jan		1.993	1.995	
							Feb		2.276	2.267	
							Mar		2.290	2.279	
							Apr		2.022	2.024	
							May		1.870	1.878	
							Jun		1.765	1.776	
							Jul		1.679	1.690	
							Aug		1.564	1.580	
Sep	1.441	1.462									

IUA	Class	River	Resource Unit	Ecological Category	Component	Sub Component	RQO	Indicator	Numerical Unit																										
						High flows	EWR high flows: Crocodile River at CROC_EWR3 in A21J NMAR = 143.3x10 ³ m ³ REC=C/D category	Floods High flow also specified as individual flood requirements in terms of size and duration	<table border="1"> <thead> <tr> <th colspan="2">High flows (m³/s)</th> </tr> </thead> <tbody> <tr><td>Oct</td><td>0</td></tr> <tr><td>Nov</td><td>1.717</td></tr> <tr><td>Dec</td><td>2.942</td></tr> <tr><td>Jan</td><td>0</td></tr> <tr><td>Feb</td><td>6.191</td></tr> <tr><td>Mar</td><td>1.668</td></tr> <tr><td>Apr</td><td>0</td></tr> <tr><td>May</td><td>0</td></tr> <tr><td>Jun</td><td>0</td></tr> <tr><td>Jul</td><td>0</td></tr> <tr><td>Aug</td><td>0</td></tr> <tr><td>Sep</td><td>1.729</td></tr> </tbody> </table>	High flows (m ³ /s)		Oct	0	Nov	1.717	Dec	2.942	Jan	0	Feb	6.191	Mar	1.668	Apr	0	May	0	Jun	0	Jul	0	Aug	0	Sep	1.729
High flows (m ³ /s)																																			
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Jun	0																																		
Jul	0																																		
Aug	0																																		
Sep	1.729																																		
					Quality	Nutrients	Instream concentration of nutrients must be improved to sustain aquatic ecosystem health	Orthophosphate (PO ₄ ⁻) as Phosphorus	≤ 0.050 milligrams/litre (mg/l) (50 th percentile)																										
				Nitrate (NO ₃ ⁻) & Nitrite (NO ₂ ⁻) as Nitrogen				≤ 1.0 milligrams/litre (50 th percentile)																											
				Salts		Instream salinity must be maintained at current status to ensure protection of resource and	Sulphate	≤ 90 milligrams/litre (95 th percentile)																											
					Sodium		≤ 60 milligrams/litre (95 th percentile)																												
					Chloride		≤ 70 milligrams/litre (95 th percentile)																												

IUA	Class	River	Resource Unit	Ecological Category	Component	Sub Component	RQO	Indicator	Numerical Unit
							sustainability of the resource		
						Pathogens	The presence of pathogens should pose no risk to human health.	<i>Escherichia coli</i> (<i>E.coli</i>)	130 counts/100 millilitres (ml) (95 th percentile)
						System variables	pH range must be maintained within limits specified to support the aquatic ecosystem and water user requirements.	pH range	6.5 (5 th percentile) and 8.5 (95 th percentile)
							A baseline assessment to determine the present state instream turbidity is required.	Turbidity	A 10% variation from background concentration is allowed.
							Dissolved oxygen levels must be	Dissolved Oxygen	≥ milligrams/litre (mg/l)

IUA	Class	River	Resource Unit	Ecological Category	Component	Sub Component	RQO	Indicator	Numerical Unit
							attained to support the aquatic ecosystem.		
						Toxics	The concentrations of toxicants must pose no risk to aquatic organisms and to human health.	Ammonia as N	≤ 0.0725 milligrams/litre (mg/l) (95 th percentile)
					Aluminium (Al)			≤ 0.105 milligrams/litre (mg/l) (95 th percentile)	
					Manganese (Mn)			≤ 0.15 milligrams/litre (mg/l) (95 th percentile)	
					Iron (Fe)			≤ 0.1 milligrams/litre (mg/l) (95 th percentile)	
					Lead (Pb) hard			≤ 0.005 milligrams/litre (mg/l) (95 th percentile)	
					Copper (Cu) hard			≤ 0.0073 milligrams/litre (mg/l) (95 th percentile)	
					Nickel (Ni)			≤ 0.07 milligrams/litre (mg/l) (95 th percentile)	
					Atrazine			≤ 0.078 milligrams/litre (mg/l)	

IUA	Class	River	Resource Unit	Ecological Category	Component	Sub Component	RQO	Indicator	Numerical Unit
								Mancozeb	0.009 milligrams/litre (mg/l)
								Glyphosate	0.7 milligrams/litre (mg/l)
								Endosulfan	0.13 micrograms/litre (ug/l)
					Habitat	Instream	Habitat diversity should be improved from a D ecological category to a C/D category. Flow variation concern for flow and habitat dependent biota. Flow should be adequate for flow dependent taxa.	Index of Habitat Integrity, Rapid Habitat Assessment Method and Model (RHAMM), Geomorphic Assessment Index	Instream Habitat Integrity EC = C/D ≥58%
						Riparian habitat	Riparian vegetation should be maintained at a C/D ecological category or improved upon.	Index of Habitat Integrity, Vegetation Response Assessment Index	VEGRAI EC = C/D ≥58%. Prohibit any further development into riparian zone.

IUA	Class	River	Resource Unit	Ecological Category	Component	Sub Component	RQO	Indicator	Numerical Unit
							Alien vegetation infestation must be controlled and developments into the riparian zone should be prohibited.		
					Biota	Fish	Fish community should be improved from a D ecological category to a C/D category. Regulated Seasonality required to accommodate flow sensitive fish species.	Fish Response Assessment Index (FRAI)	Fish ecology category = C/D FRAI ≥58% Indicator species in (<i>Crocodile River</i>): <i>AJOH</i> ,
						Aquatic Macroinvertebrates	Macroinvertebrate assemblage must be maintained within a D ecological	Macroinvertebrate Response Assessment Index, and the South African	MIRAI EC = D ≥ 42% SASS ≥ 60 ASPT ≥ 4.0

IUA	Class	River	Resource Unit	Ecological Category	Component	Sub Component	RQO	Indicator	Numerical Unit
							category or improved upon.	Scoring System Version 5 (SASS5).	
						Semi aquatic biota	The suitability of this stretch of river to serve as a habitat for aquatic bird and mammal populations must be maintained through proper habitat management. Riparian zone habitat must be improved.	Aquatic birds/Indicator mammal species	A baseline assessment should be conducted to determine the aquatic bird community and representative mammal species along the river reach. There is a need to set a numerical RQO for density of animals/birds based on the available/collected data.
						Diatoms	Diatom assemblage must be maintained within a D ecological category or improved upon.	Specific Pollution Index	Diatom EC = D ≥ 42%

7.4.5 SURFACE WATER USER SURVEY

The water of the streams in the area is mainly used by farmers for stock watering. In certain areas in-formal settlements also use the water for washing and domestic purposes.

7.4.6 SURFACE WATER SENSITIVITY

On site observations, together with 1: 50 000 maps, 1: 10 000 ortho-photo's as well as the NFEPA (National Freshwater Ecosystem Priority Areas) database (CSIR 2011) were used to establish the presence of wetlands. Refer to Figure 8.

7.5 WETLANDS

On site observations, together with 1: 50 000 maps and 1: 10 000 ortho-photos were used to establish the presence of wetlands. As indicated in Figure 8 under Section 7.4.2, a channelled valley bottom wetland intersects the Millsell and Waterkloof Section boundary and is located on the western section of the opencast mine.

7.6 HYDROGEOLOGY

Groundwater is a very important water resource in the study area and is used for domestic supply in agricultural properties surrounding the mines. The Millsell and Waterkloof Sections are located within the Kroondal / Marikana Strategic Groundwater Source Area. Previous hydrogeological studies at the site have been undertaken and observations and results of these studies are discussed below.

7.6.1 AQUIFER CLASSIFICATION

The bedrock at the investigation area is interbedded lava of the Rustenburg Layered Suite (RLS) that forms part of the primary Bushveld Igneous Complex (BIC) zone. Rocks of the RLS are characterised by well-developed layering, a result of fractional crystallisation, and consist mainly of ultramafic rocks including norite, gabbro, anorthosite and pyroxenite.

The storage, movement and occurrence of groundwater in these naturally impermeable rocks are controlled by their secondary geo-hydrological properties i.e., deep weathering and fracture zones.

The nature of the water bearing rocks from the BIC lacks significant primary porosity and is dominantly arenaceous strata. The secondary hydrological properties developed as a result of openings produced by jointing, faulting and physical weathering will determine permeability and storage. These rocks have variable susceptibilities to weathering, with norites weathering more easily. Higher permeability occurs in limited zones, especially in the country rock adjacent to structural features.

Extractable groundwater held within the gabbro is usually associated with water-bearing weathered formations within the rocks or the fractured contacts adjacent to intrusive sills or dykes. Overall, the groundwater potential of these aquifers varies considerably from high to low, although significant yields have been reported where

boreholes are sited within faults. Natural features such as dykes, geological contacts and faults often provide impermeable barriers along which storativities and transmissivities are enhanced.

Drilling results at the Millsell Section and in neighbouring areas suggested that the main aquifer lies between 2.5 and 27 metres below ground level (mbgl). Previous studies in the area have distinguished between two aquifer systems comprising a shallow weathered aquifer and a deeper fractured system. However, the aquifer may be described as one continuous entity with the groundwater body extending from the weathered zone into the fractured zone. The interacting aquifer systems can be described as follows:

- The first system is a shallow aquifer (minor aquifer system) that occurs in the transitional soil and weathered bedrock zone or sub-outcrop horizon. The yields in this aquifer are generally low (less than 1 l/s, the highest recorded yield is approximately 2 l/s) and the aquifer is often not fit for supplying groundwater on a sustainable basis. Consideration of the shallow aquifer system becomes important during seepage estimations from pollution sources to receiving groundwater and surface water systems. The shallow weathered zone aquifer plays the most important role in mass transport simulations from process and mine induced contamination sources because the lateral seepage component in the shallow weathered aquifer often dominates the flow. Due to the mainly lateral flow and sometimes phreatic nature of the weathered zone aquifer, its limited thickness and low transmissivity, it is usually only affected by opencast mining or by high extraction or shallow underground mining where subsidence occurs and the entire roof strata above the mined area is destroyed. Where mining becomes deeper, the weathered zone aquifer is usually affected to a very limited extent.
- The second, main aquifer system is the deeper secondary fractured rock aquifer where groundwater yields, although more heterogeneous, can be much higher. This aquifer system usually displays semi-confined or confined characteristics with piezometric heads often significantly higher than the water-bearing fracture position. Fractures may occur in any of the coexisting host rocks due to different tectonic, structural and genetic processes. The deep aquifer system is weak and confined to poorly / unconnected, widely spaced, steep semi-regional fractures at depths deeper than 100 meters below surface (mbs) in a hard, impervious leucogabbro-norite bedrock where flow is restricted to the fractures. Evidence suggests that an increase in recharge occurs locally in areas where mining is much shallower by downward leakage from the shallow aquifer system. This may be rapid during high rainfall periods.

The aquifer beneath the Millsell and Waterkloof Sections can be classified as a minor aquifer, due to the general yields of less than 2.5 L/s, and the fact that much of the site has already been affected by mining. The prevailing geological conditions are fractured or potentially fractured rocks which do not have a high primary permeability and other formations of variable permeability. Aquifer extent may be limited with variable water quality. Although these aquifers seldom produce large quantities of water, they are important both for local supplies and in supplying base flow to rivers.

7.6.2 GROUNDWATER LEVELS

The water levels are between 2.6 m to 22 m in a 3 km radius of the mine (2011 Hydrocensus) and using data from the groundwater archive for a wider area, the water levels range from 0.5 m to 96 m (Barnard, 2000) (Table

15). Season fluctuation of water levels have been observed in farmers' boreholes and from historic water level data it can be inferred that pre-mining water levels around the mine were not similar to those measured during monitoring surveys and specialist studies. Table 14 indicates the water levels for the Millsell and Waterkloof Sections during a survey in 1999.

Table 14: Water levels in boreholes close to Millsell and Waterkloof Sections in 1999

No.	Coordinates (WGS84)				Borehole Depth (m)	Water level (mbgl)	Estimated yield (l/s)	Water usage
	Latitude (S)	Longitude (E)	Latitude (S)	Longitude (E)				
B10	- 25.71356 °	27.29237 °	-25° 42' 48.82	027° 17' 32.53	-	2.73	-	None
B11	- 25.69999 °	27.27740 °	-25° 41' 59.96	027° 16' 38.64	-	14.38	-	None
B12	- 25.71402 °	27.29205 °	-25° 42' 50.47	027° 17' 31.38	-	-	-	None
B13	- 25.70198 °	27.28050 °	-25° 42' 07.13	027° 16' 49.80	-	12.78	-	None
B14	- 25.71405 °	27.29185 °	-25° 42' 50.58	027° 17' 30.66	-	2.19	-	None
B15	- 25.71300 °	27.29542 °	-25° 42' 46.80	027° 17' 43.51	-	-	-	None
B16	- 25.70444 °	27.28629 °	-25° 42' 15.98	027° 17' 10.64	-	-	*	Domestic
B17	- 25.71831 °	27.26718 °	-25° 43' 05.92	027° 16' 01.85	-	13.04	-	Domestic
B18	- 25.70445 °	27.28668 °	-25° 42' 16.02	027° 17' 12.05	-	5.56	-	None
B19	- 25.71806 °	27.28612 °	-25° 43' 05.02	027° 17' 10.03	-	9.07	-	None
B20	- 25.70224 °	27.28576 °	-25° 42' 08.06	027° 17' 08.74	-	23.00	-	None
B21	- 25.70114 °	27.28363 °	-25° 42' 04.10	027° 17' 01.07	-	13.55	-	Domestic
B22	- 25.70185 °	27.26778 °	-25° 42' 06.66	027° 16' 04.80	-	-	-	Domestic
B23	- 25.70029 °	27.26766 °	-25° 42' 01.04	027° 16' 03.58	-	16.4	-	Domestic and Irrigation
B24	- 25.68654 °	27.26766 °	-25° 41' 11.54	027° 16' 03.58	-	21.73	-	Domestic and Irrigation
B25	- 25.68669 °	27.26889 °	-25° 41' 12.08	027° 16' 08.40	-	13.60	-	None
B26	- 25.70057 °	27.28389 °	-25° 42' 02.05	027° 17' 02.40	-	-	-	Domestic and Irrigation
B27	- 25.70138 °	27.30095 °	-25° 42' 04.97	027° 18' 03.42	-	9.85	-	Domestic
B68	- 25.70138 °	27.28195 °	-25° 42' 04.97	027° 16' 55.02	30	15.44	0.6	monitoring
B69	- 25.71369 °	27.28895 °	-25° 42' 49.28	027° 17' 20.22	35	6.04	8	Monitoring
B70	- 25.7121 °	27.89662 °**	-25° 42' 43.56	027° 17' 47.83	30	16.53	2	Monitoring
Avg.						12.24		
** Coordinates as provided in 2000 EMPR but does not plot near Millsell								

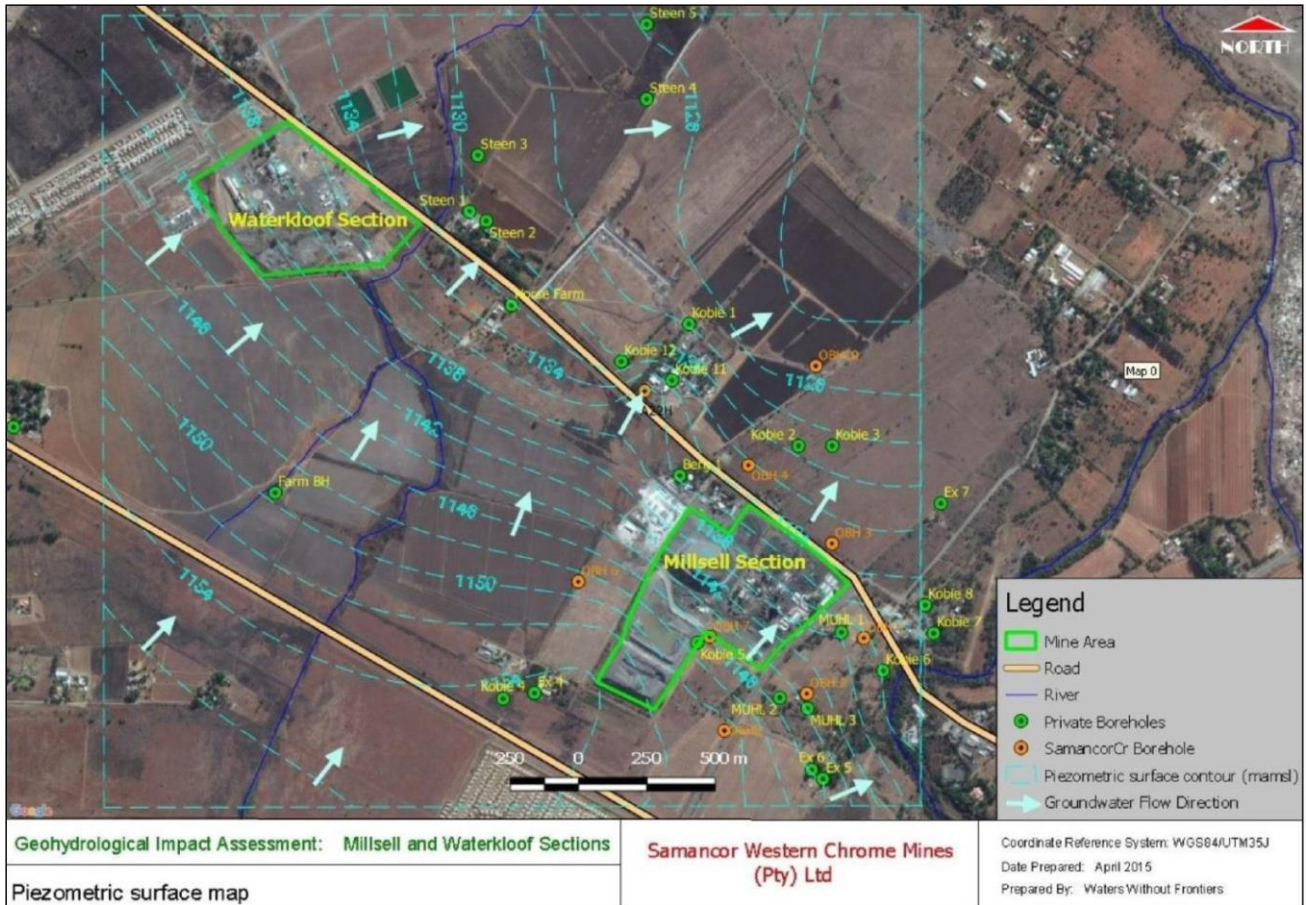


Figure 9: Interpreted ground water level contours (2015)

Table 15: Groundwater characteristics in the study area

Parameter	Borehole Depth (m below surface)	Water Strike (m below surface)	Yield (l/s)	Water level (m below surface)
No of samples (boreholes)	177	156	156	135
Minimum	13	2.4	0	0.5
Maximum	181	181	11	96
Median	37	24.4	0.6	11.9
Average	44.5	27.3	1.4	12.6

7.6.3 GROUNDWATER FLOW GRADIENTS, VELOCITIES AND YIELDS

Groundwater flow is regionally in a north-eastern direction and feeds into the Hex River as baseflow (Figure 10). Mining and agricultural activities have altered groundwater gradients, and groundwater flow directions. The groundwater gradient across the tailings dam expansion site is in the order of 0.01 mv/mh and 0.012 mv/mh (meter vertical / meter horizontal). Groundwater gradients become steeper to the east/southeast of the site as a result of dewatering from the Millsell underground workings, up to 0.045 mv/mh.

The groundwater Darcy flow velocity for the site is highly variable and calculated to be 0.1 to 0.25 m/d (36.5 to 90 m/a).



Figure 10: Piezometric surface map at Samancor Millsell section (2011)

7.6.4 YIELDS

The study area is classified as having low to medium groundwater potential, characterised by borehole yields in the range 0.5 L/s to 2 L/s (litres per second). Higher borehole yields, greater than 5 L/s, are however not uncommon, where well-developed fracture zones and faults are intersected. Yields that were measured in 1999 estimated that yields vary from less than 1 000 L/h (litres per hour) (0.2 L/s) to more than 10 000 l/h (2 L/s).

The groundwater harvest potential, which defines the maximum volume of groundwater that may be abstracted per square kilometre per annum without depleting the aquifers, is estimated to be 12 000 m³/km²/a for the study area (Seymour & Seward 1996).

7.6.5 AQUIFER TRANSMISSIVITY AND STORATIVITY

Aquifer parameters such as transmissivity and storativity are vital parameters in the construction of a comprehensive flow and mass transport model (IWWMP 2019). Aquifer parameters that were calculated in similar chrome mining environments were used in the model construction process and are presented in Table 16. The average transmissivity of the aquifer matrix in the larger Western Chrome lease area (Table 16) is expected to be around 0.4 and 1.7 m²/d while the fracture zones in the solid or weathered bedrock aquifers can be as high as 300 m²/d. Storativity has been calculated by numerous different methods with the results published widely and values of around 0.005 - 0.01 for matrix and 0.0005 - 0.001 for the fracture zone are taken as representative for the igneous rock types occurring in the area.

Table 16: Summary of aquifer parameters and yields calculated from pump tests in the area

Borehole	Transmissivity		Sustainable Yield (L/s)
	Pump (m ² /d)	Recovery (m ² /d)	
GCS2	1.3	0.9	0.1
GCS4	80	280	6.0
GCS5	70	100	5.5
GCS6	0.4	0.4	0.04
GCS10	1.0	0.3	0.1
GCS11	0.4	0.4	0.04
Geometric mean	0.8	0.6	0.1
Harmonic mean	3.1	3.1	0.3
Average	2.0	1.9	0.2

7.6.6 GROUNDWATER RECHARGE

Natural groundwater recharge represents the portion of rainfall, which reaches an aquifer irrespective of whether it follows a preferential flow path via fractures, or drains through a column of soil, or infiltrates from free water in river channels. Aspects, which influence the recharge rate, are unsaturated zone characteristics (soil type, thickness, hydraulic parameters), topography, evapotranspiration (for example vegetation type and density).

The recharge rate for Millsell was estimated to be 3% of the mean annual precipitation (MAP = 658 mm) by previous studies (GHT Report RVN 276/404 (2001) as cited in the 2011 groundwater report) and was indicated as 32 mm to 45 mm per annum by Vegter (2003) as cited in the 2015 groundwater report).

7.6.7 HYDROCENSUS

No springs were identified during the hydro-census field visits. In the area under investigation in the 2000 EMPr a total of 21 boreholes were identified. However, during the hydro-census conducted in 2011, 30 boreholes were identified of which 17 are privately owned (Figure 12). The area under investigation is densely occupied with production boreholes. The reason, therefore, is due to the small sizes of the plots and the intensive agricultural activities. In the 2011 and 2015 survey 49 boreholes were identified of which seven are WCM monitoring boreholes. Figure 11 provides an indication of the hydrocensus boreholes identified in 1999, 2004 and 2015.

Rand Water Board supplies most properties in the area with water though private groundwater users were identified in the area. These users are mainly owners of small agricultural holdings, farmers and their workers or communities" living on the properties. Groundwater is used for:

- Domestic use;
- Agricultural Use- Irrigation; and
- Mine usage.

The average depth of the water table in the area under investigation is 12.24 mbgl. It must be kept in mind that a great part of the existing boreholes does not have any borehole information. According to the local, mine personal the groundwater levels in this area are variable with the rainfall, yet constant over the period of several years.

From the values obtained from several of the farmers with regard to their own boreholes it appears as if the water levels in this area show seasonal fluctuations, some of them argued about the lowering of their water table. It can be assumed that the pre-mining water levels around the mine were not similar to those found during the previous studies.

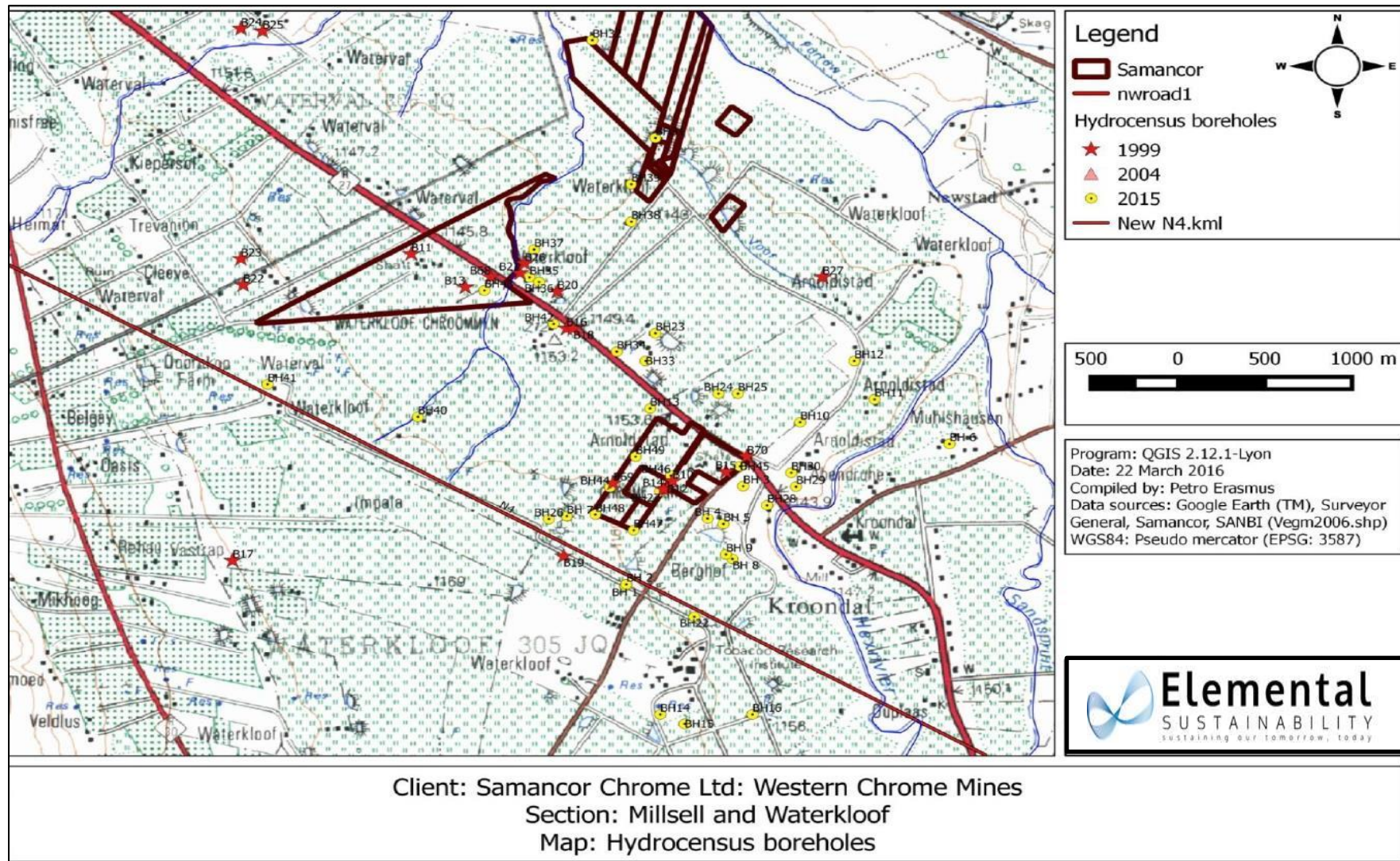


Figure 11: Location of Hydrocensus Boreholes identified (Menco 2016)

BH ID	Coordinate (WGS84)		Depth (m)	Yield (l/s)	Water strike (m)	Water Level (m)	Property	Comment
	Latitude (S)	Longitude (E)						
BH 1	-25.7198 ° -25° 43' 11.35"	27.28965 ° 027° 17' 22.74"					Plot 305 Waterkloof	Bh equipped with a submersible pump. Supplying drinking water to homestead. No access to water level. No problems reported with both water quantity and quality
BH 2	-25.7197 ° -25° 43' 10.99"	27.28972 ° 027° 17' 22.99"				8.71		Open casing. Water level measured at 13:48 on 01/07/10
BH 3	-25.7139 ° -25° 42' 49.90"	27.29641 ° 027° 17' 47.08"	30 - 35			8.81	Portion 285 of Waterkloof 305 JQ	Delivery pipe stolen. Previously used to water the adjacent soccer pitch. Water level accessible.
BH 4	-25.7158 ° -25° 42' 56.88"	27.29438 ° 027° 17' 39.77"	30 - 35					Bh equipped with a submersible pump. WQ reported to be very bad & used only for laundry and bathing. Water level inaccessible
BH 5	-25.7161 ° -25° 42' 58.03"	27.29529 ° 027° 17' 43.04"	30 - 35					Equipped with submersible pump. Supplies drinking water to homestead.
BH 6	-25.7113 ° -25° 42' 40.82"	27.30823 ° 027° 18' 29.63"						
BH 7	-25.7157 ° -25° 42' 56.38"	27.28631 ° 027° 17' 10.72"					Plot 453 Waterkloof	Bh equipped with a submersible pump and used for domestic supply. WQ reported to be bad. Water level inaccessible
BH 8	-25.7182 ° -25° 43' 05.56"	27.2958 ° 027° 17' 44.88"	35		25	1.48	Plot 145 Waterkloof	Bh equipped with a submersible pump and used for domestic supply. No problem with both water quantity and quality
BH 9	-25.7179 ° -25° 43' 04.58"	27.29543 ° 027° 17' 43.55"	35		25	3.23	Plot 145 Waterkloof	
BH10	-25.71 ° -25° 42' 36.14"	27.29968 ° 027° 17' 58.85"						Bh equipped with a submersible pump and used for gardening. Drinking water supplied by Magalies Water. WQ reported not to be good.
BH11	-25.7087 ° -25° 42' 31.21"	27.30393 ° 027° 18' 14.15"				10.18	Plot 528 Waterkloof	Bh equipped with a submersible pump and used for domestic supply. No problem with both water quantity and quality
BH12	-25.7064 ° -25° 42' 23.00"	27.30278 ° 027° 18' 10.01"					Plot 111 Waterkloof	Pump stolen. Open casing in the ground
BH13	-25.7092 ° -25° 42' 33.19"	27.29109 ° 027° 17' 27.92"					Plot 410 Waterkloof	Equipped with submersible pump. Supplies domestic water to homestead.
BH14	-25.7275 ° -25° 43' 39.00"	27.29167 ° 027° 17' 30.01"					Agricultural Research Commission (ARC) Farm	Equipped with a mono pump. Borehole not in use. Water level inaccessible.
BH15	-25.7281 ° -25° 43' 41.02"	27.29306 ° 027° 17' 35.02"				10.51		

Figure 12: Hydrocensus borehole results

7.6.8 GROUNDWATER QUALITY

Aquatico Scientific (Pty) Ltd. is contracted to conduct the water monitoring at the Millsell and Waterkloof Sections. As per the WUL requirements, Aquatico conducts quarterly groundwater monitoring for the following variables:

- pH;
- Electrical Conductivity (EC);
- Total Dissolved Solids (TDS);
- Total Hardness;
- Total Alkalinity;
- Temperature;
- Ca, Mg, Na, K, Cl, SO₄, F, NO₃-N, NO₂-N NH₄-N, NH₃-N;
- Total Inorganic Nitrogen (TIN);
- PO₄-P;
- Dissolved Oxygen (DO);
- Al, Fe, Mn, Cd, Cr, Cu, Ni, Pb, Zn; and
- Sodium Adsorption Ratio (SAR).

7.6.9 POTENTIAL POLLUTION SOURCE IDENTIFICATION

The following may represent sources of groundwater pollution:

- Tailings dam(s);
- Backfilled old opencast pit;
- Waste rock, overburden dump;
- Underground mining activities; and
- Sewage works.
- Potential nitrate and sulphate contribution by Millsell Mine

Potential sources of groundwater contamination currently present at Millsell Section are:

- Seepage from the tailings dam pond and surrounding trenches. Tailings dam areas have been operational since 1989/1990. The Millsell area is covered with an impermeable clay layer of about 1 m thickness. The clay layer below the tailings dam footprint was, however, excavated for earth works (starter wall). This has potentially increased the seepage loss from the tailing's dams.
- The mine also potentially contributes to the water quality of the Muhl farm dam, situated down gradient of the tailings dam. The dam receives its water from run-off (which includes irrigation land); groundwater seepage (groundwater daylight into dam) and occasional overflow from the tailings dam and return water dam seepage. Both agricultural and mining activities therefore potentially contribute to the water quality.

7.7 WATER AUTHORITY

The DWS with the regional office based in Hartbeespoort is the commenting authority for this area.

7.8.1 REGIONAL CONSERVATION ASSESSMENTS

As indicated in Figure 14, the Millsell-Waterkloof opencast mine is located outside of the Magaliesberg Biosphere Reserve and the Important Bird Area. As per the North West Biodiversity Sector Plan, the largest portion of the project area falls within a terrestrial CBA2 area and ESA2, with sections indicated as an aquatic ESA1 and ESA2.

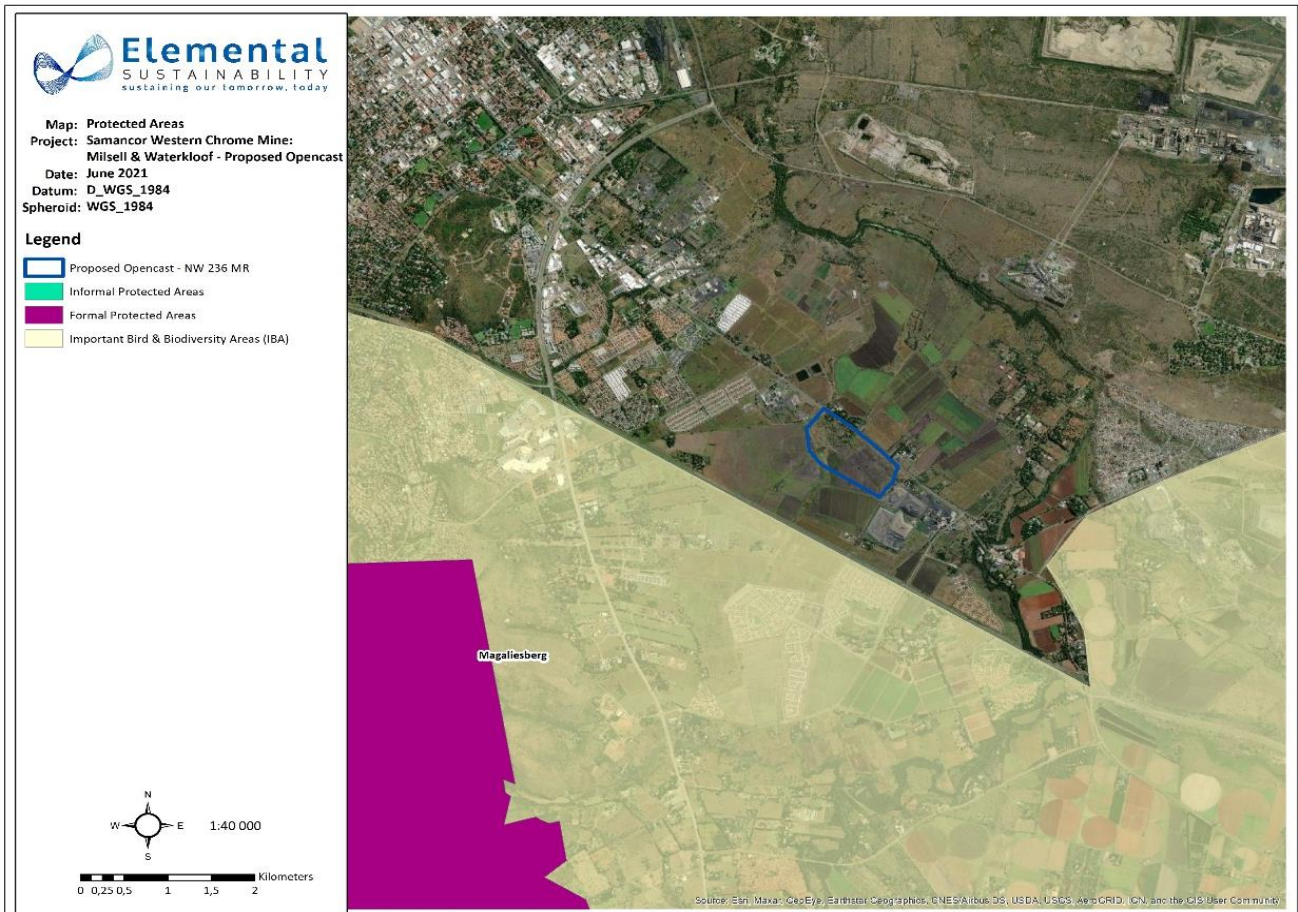


Figure 14: Protected areas located around the opencast section of Waterkloof

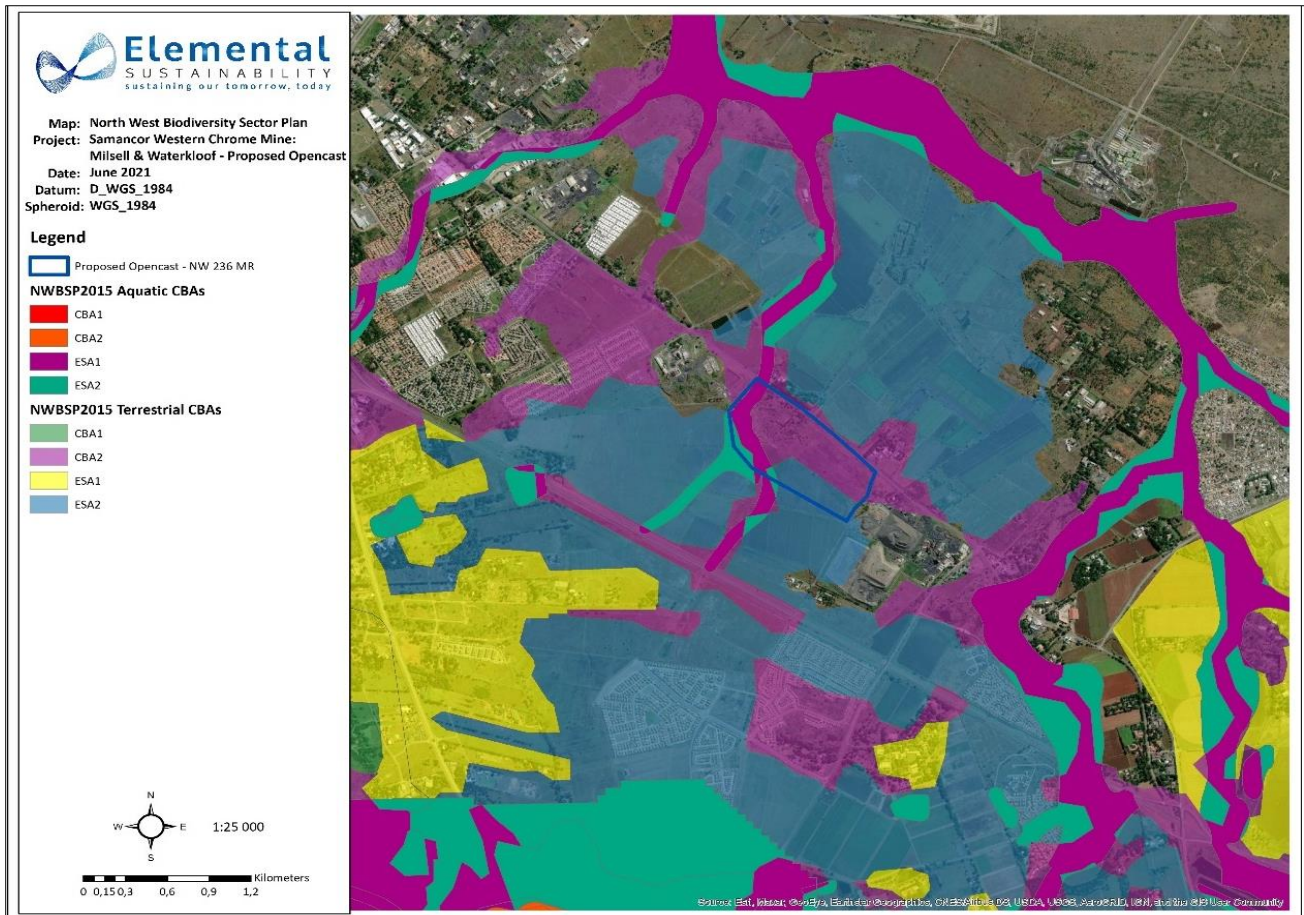


Figure 15: North West Biodiversity Sector Plan

7.9 FAUNA (ANIMAL LIFE)

As discussed in the 2010 EMPr (M2 2010), the area has been severely impacted on by current and past land-use practices, which have resulted in impoverished fauna. The majority of the larger wildlife no longer exists within the mining lease area and its border surroundings. This can be attributed to the disturbed condition of the veld as well as the high general disturbance factor due to the proximity of people as well as dogs. There is a significant number of livestock on the surrounding farms.

7.10 AGRICULTURAL

The below section provides an overview of the land type, the soil forms, the land capability, and agricultural potential of the Waterkloof opencast mine.

7.10.1 SOIL TYPES

The soil forms and families identified on WCM properties are indicated in Table 17. Pre-mining land use was exclusively for agricultural purposes.

Table 17: Soil forms and families identified on WCM properties

Soil Form	Soil Family	Diagnostic Horizons
Arcadia	Rustenburg	Vertic A: Unspecified – non-diagnostic saprolite
Rensburg	Rietkuil	Vertic A: G Horizon
Katspruit	Slangspruit	Orthic A: G Horizon
Hutton	Stella	Orthic A: Red Apedal B
Oakleaf	Caledon	Orthic A: Neocutanic B
Mispah	Myhill / Gulu	Orthic A: Hard Rock

The dominant soil of the Millsell area consists of the Arcadia form (vertic A horizon on hard rock). It has a black colour with a thickness between 40 and 60 cm. The clay content of the vertic A horizon is more than 60%, with a medium to strong, fine blocky to crumble structure. The underlying rock is hard to very slightly weathered.

Soils of the Rensburg form, consisting of a vertic A horizon on a G horizon, covers the rest of the area. This vertic A horizon has a black colour, with a thickness of between 40 and 60 cm. It has a medium to strong, fine blocky to crumble structure, with a clay content of more than 65%. The transition to the G horizon is Gentle. The G horizon consists of a mottled green, massive gleyed material.

The vertic a horizon has a has a high fertility due to the high cation exchange capacity (140 cmol/kg clay) and high clay content of the soils. It has a low erodibility in its natural state but will easily erode when put onto a slope.

7.10.1.1 SOIL FERTILITY AND ERODIBILITY

The soils that are present have a low erodibility in its natural state but will easily erode when put onto a slope. The soils of the Arcadia form have a high fertility due to the high cation exchange capacity (140 cmol/kg clay) and high clay content. It has a low erodibility in its natural state but will erode easily when put onto a slope.

7.10.1.2 SOIL DEPTH

Soil depth is fairly consistent and consists of about 0.8 m black vertisolic clay, which overlies 15.0 m of weathered pyroxinite.

7.10.1.3 SOIL POTENTIAL (DRY LAND / IRRIGATION / GRAZING)

The available moisture capacity of the Arcadia Form (the dominant soil form) soils is moderate. The intake rate and drainage in these soils is poor. There are moderate tillage constraints in these soils due to the extremely strong structure and cloddy consistency. They tend to be very slippery when wet and hard and cloddy when dry, making it extremely difficult to get a good till. These soils should not be worked when too wet or too dry, as hard clods will form. The nutrient status is fair, but fertilizer supplements will be required. The dry land cultivation potential of these soils is poor.

Generally, the irrigation potential of the area is generally fair to poor. Water intake rates decline rapidly when the soils are moistened and hence furrow irrigation is usually preferable. Only groundwater from boreholes would be available in the area for irrigation purposes. The area has been irrigated in the past, using groundwater from boreholes in the area. Salinity and sodality problems are of concern on these soils and will be aggravated by salt concentrations if the irrigation process recharges the groundwater source.

7.10.2 PRE-MINING LAND CAPABILITY

Historically (before 1972), the main land use in the area was agriculture. According to the Eco Rehab addendum published in December 2002, the land was used for grazing and farming of a variety of crops for example maize, tobacco, cotton, citrus, etc., although consideration must be given to the low rainfall figure. Currently, the main land use in the region is mining, agriculture and residential. Most of the site is currently under mining as shown in Figure 17.

Land capability was determined using data obtained from the soil survey and classified using two methods – the Chamber of Mines Classification System (1991) and the system developed by Camp (1998). Most of the site is uniformly underlain by two soil forms and a single land capability class. Table 18 gives a summary of the land capability classes of the different soil types.

The production capacity of tons/ha is not available. There are no available figures for the carrying capacity of these soils. Indications in the area are that the carrying capabilities are low, and it is cautioned as to whether these soils should be used for any form of farming. It is recommended that the end use would be better used for wilderness or held under conservation constraints.

Table 18: Land capability of the different soil types

Soil form	Soil map unit	Land Capability class
Arcadia*	A	Arable land (II) and Grazing land (III)
Rensburg	B	Grazing land (III)

The entire site comprises land of a grazing capability. Based on discussions with local farmers, 4 ha of natural grazing land can carry approximately 1 large stock unit and 10 small stock units. One ha of cultivated grazing land carries 2 large stock units and 20 small stock units.

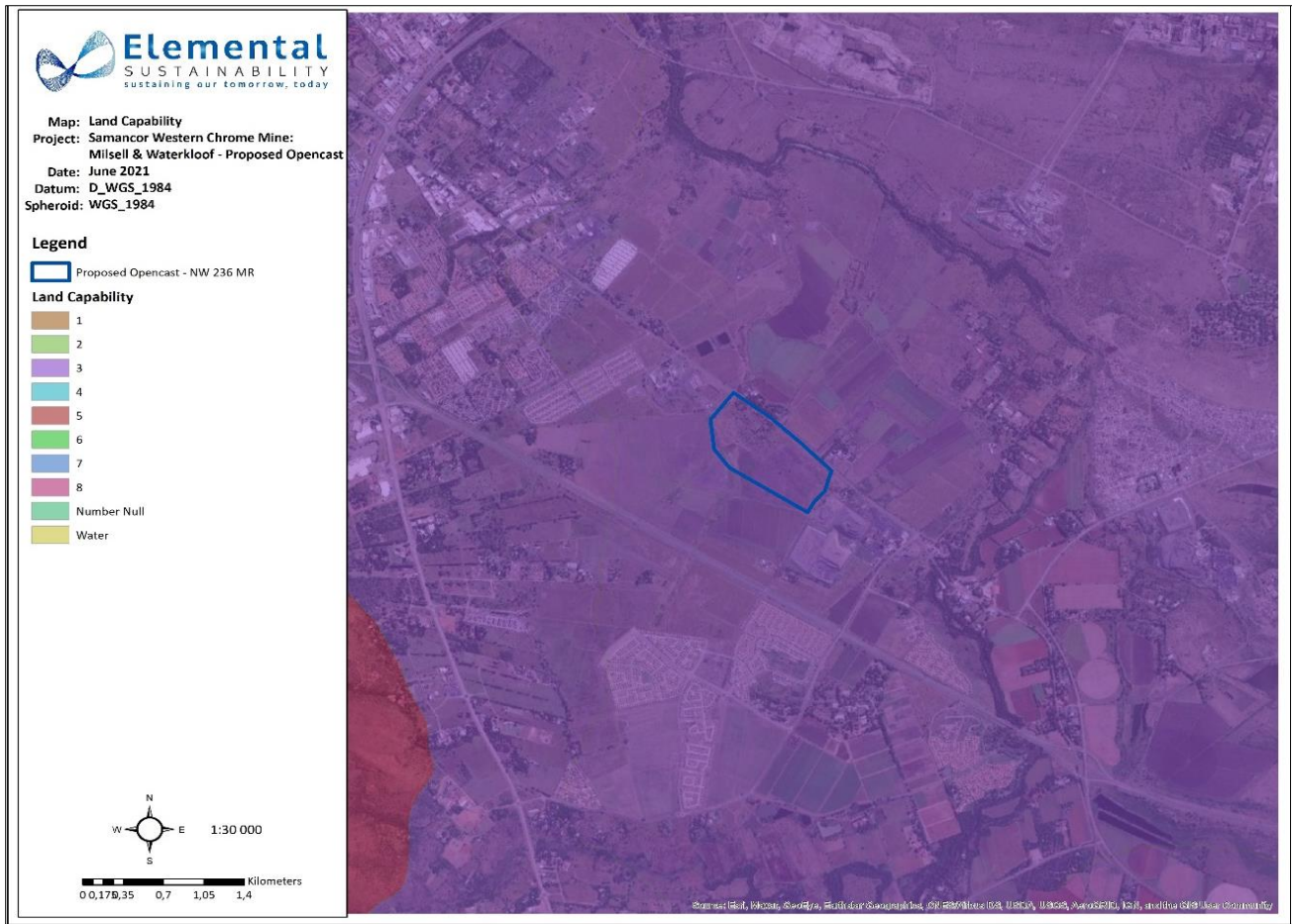


Figure 16: Land capability of the Waterkloof opencast mine area

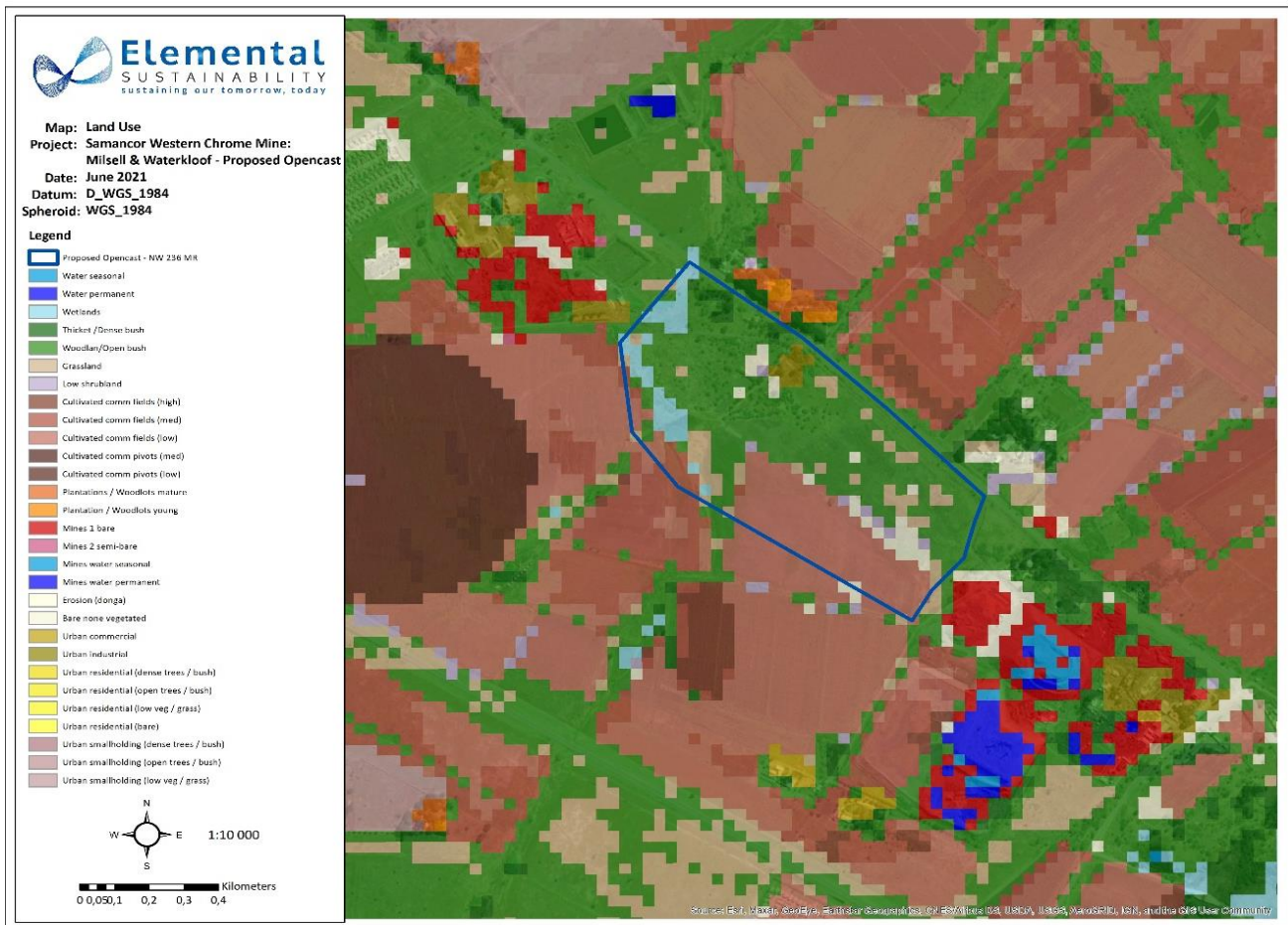


Figure 17: Land use in and around the Waterkloof opencast area

7.11 AIR QUALITY

Mining operations such as drilling, blasting, hauling, and transportation are major sources of emissions and air pollution. Emissions of particulate matter and nuisance dust will result from mineral plant operations such as crushing, screening and processing for final transportation. Fugitive emissions are also possible from roads and open stockpiles.

Nuisance dust can reduce visibility; soil or damage buildings and other materials; and increase costs due to the need for washing, cleaning and repainting. Plants can be affected by dust fallout through reduced light transmission which affects photosynthesis and can result in decreased growth. Fallout dust can also collect in watercourse causing sedimentation and a reduction in the water quality and can also affect aquatic life through the smothering of riverine habitat and fish gill clogging. Coarse dust particles are produced during mining operations which can lead to an increase in fallout dust.

Existing key sources of air pollutants for the project area includes:

- Neighbouring mining and smelting activities (north, north-east and east of the MRA);
- Vehicle dust entrainment on unpaved roads (surrounding areas); and
- Commercial agricultural activities (surrounding areas).

7.11.1 DUST FALLOUT

Monthly gravimetric dust fallout monitoring in terms of the National Dust Control Regulations (GNR 827, 2013) is performed at the Millsell and Waterkloof sections. The recorded dust fallout data obtained are compared to the limits as set in the National Environmental Management: Air Quality Act, 2004 (referred to as AQA in report) as per Government Gazette No. 36974, Notice Number 827 of November 2013.

The AQA national dust control regulations set two distinct limits relation to acceptable dust fall rates. The first limit relates to an acceptable dust fall rate ($\text{mg}/\text{m}^2/\text{day}$ (D), 30 days average) for residential areas set at $D < 600$. The AQA indicates that the dust fall rate for residential areas is permitted to exceed the set limit twice within a year but not for sequential months. The second limit relates to an acceptable dust fall rate ($\text{mg}/\text{m}^2/\text{day}$ (D), 30 days average) for non-residential areas set at $600 < D < 1200$. The AQA indicates that the dust fall rate for non-residential areas is permitted to exceed the set limit twice within a year but not for sequential months.

Table 19: Dust fallout limits for residential and non-residential areas (GNR 827, 2013)

National Environmental Management Act: Air Quality Act. Act 39 of 2004. National Dust Control Regulations		
Restriction Areas	Dust fall rate (D) ($\text{mg}/\text{m}^2/\text{day}$, 30-days average)	Permitted frequency of exceeding dust fall rate
Residential Areas	$D < 600$	Two within a year. Not sequential Months
Non-residential areas	$600 < D < 1200$	Two within a year. Not sequential Months

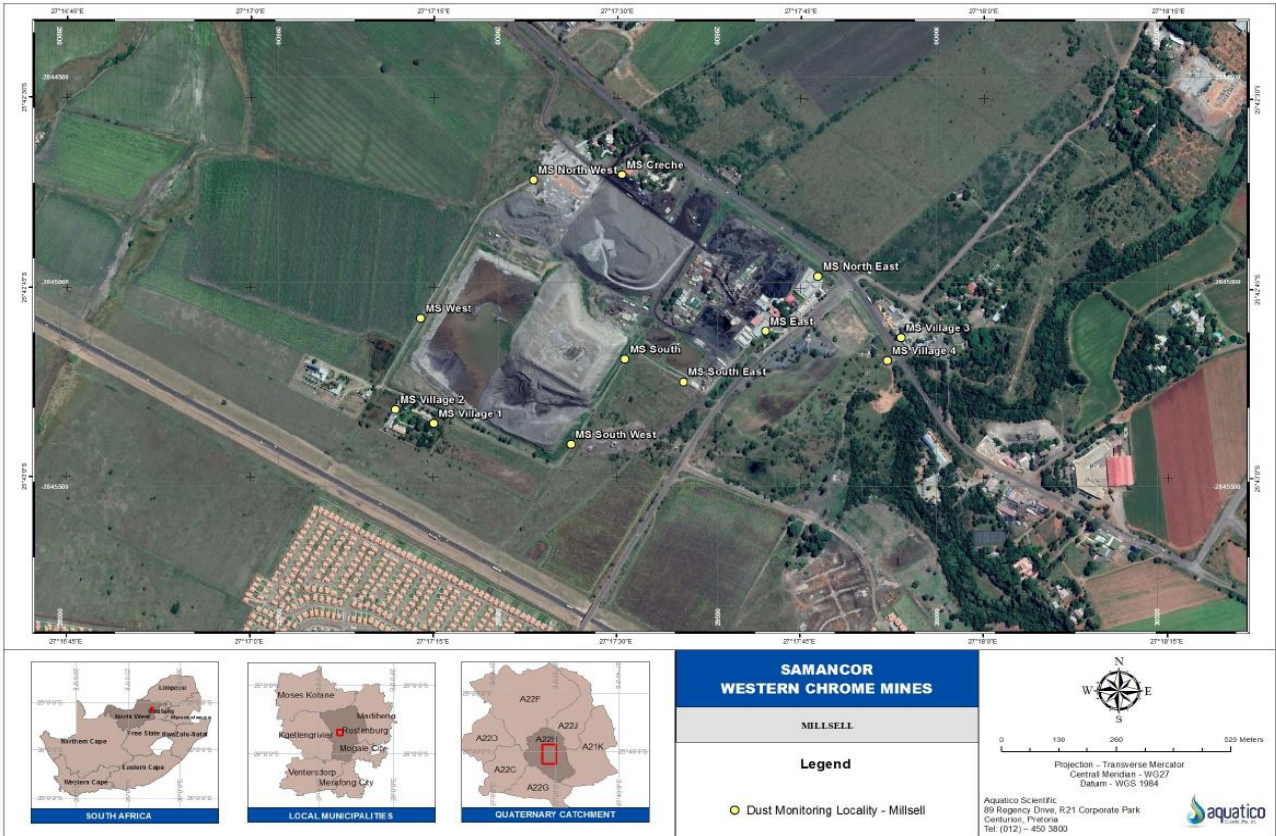


Figure 18: Aerial map of Samancor WCM – Millsell mine dust fallout monitoring locations

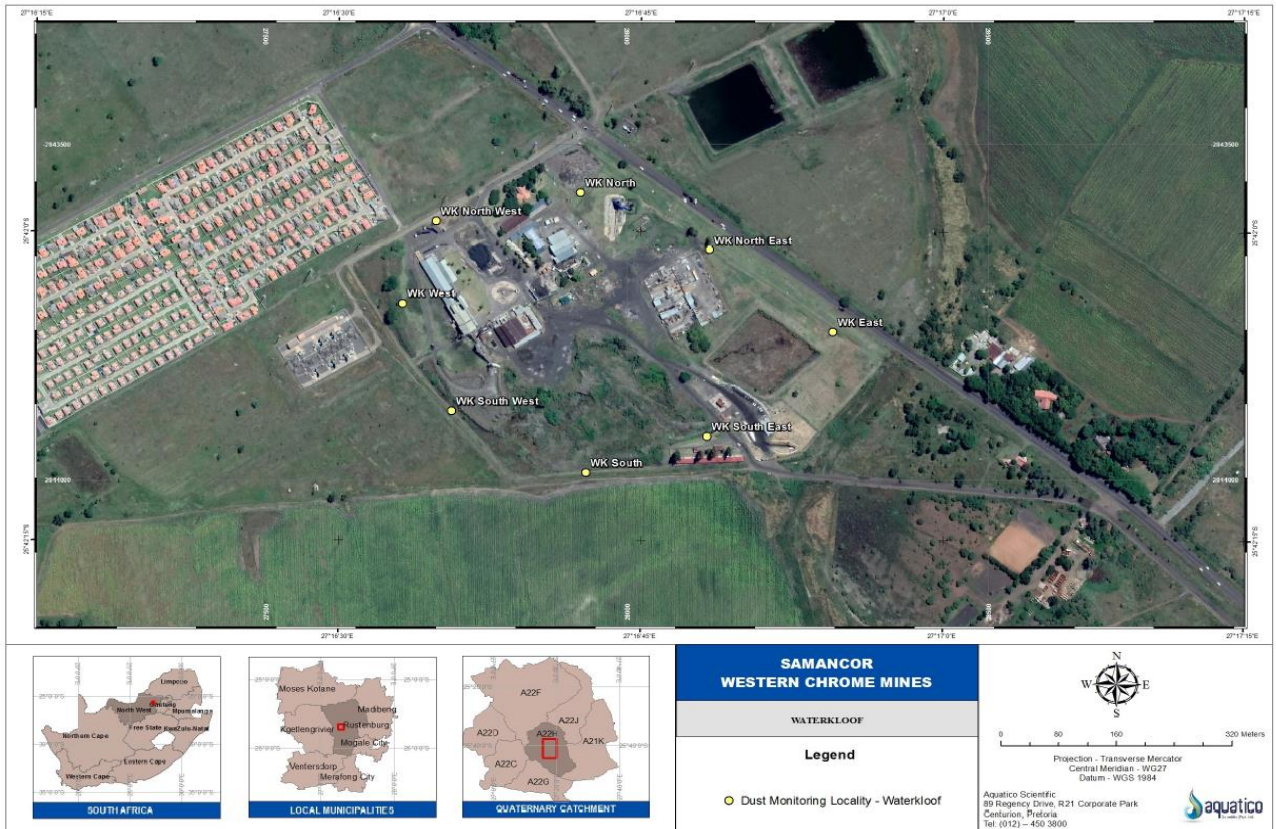


Figure 19: Aerial map of Samancor WCM – Waterloof TFS dust fallout monitoring locations

A summary of the dust samples collected by Aquatico Scientific (Pty). Ltd. during the monthly monitoring period of March 2022 is presented in Table 20 and Table 21 .

Table 20: Millsell monthly sampling register for March 2022.

SAMPLING REGISTER : MONTHLY							
PROJECT NAME		Samancor Western Chrome Mine					
MONTH		March 2022					
SAMPLER NAME		Sibusiso Simelane					
Samancor Western Chrome Mine							
Locality	Description	Coordinates		Sample Time	Status	Dust Days	Remarks
		Latitude	Longitude				
Dust fallout-Non-Residential							
MS East	Millsell East	S25.71346	E27.29501	2022-03-28 13:35	Yes	33 Days	DUST AND WATER
MS North East	Millsell North East	S25.71222	E27.29627	2022-03-28 15:40	Yes	33 Days	DUST AND WATER
MS North West	Millsell North West	S25.71015	E27.28976	2022-03-28 14:28	Yes	33 Days	DUST AND WATER
MS South	Millsell South	S25.71408	E27.29185	2022-03-28 15:27	Yes	32 Days	DUST AND WATER
MS South East	Millsell South East	S25.71455	E27.29318	2022-03-28 15:23	Yes	32 Days	DUST AND WATER
MS South West	Millsell South West	S25.71595	E27.29063	2022-03-28 15:08	Yes	32 Days	DUST AND WATER
MS West	Millsell West	S25.71322	E27.28722	2022-03-28 14:24	Demolished	-	DEMOLISHED
Dust fallout- Residential							
MS Creche	Millsell Creche	S25.71007	E27.29185	2022-03-28 14:30	Demolished	-	DEMOLISHED
MS Village 1	Millsell Village 1	S25.71556	E27.28748	2022-03-28 14:16	Yes	33 Days	DUST AND WATER
MS Village 2	Millsell Village 2	S25.71526	E27.28668	2022-03-28 14:20	Yes	33 Days	DUST AND WATER
MS Village 3	Millsell Village 3	S25.71361	E27.29812	2022-03-28 13:12	Yes	33 Days	DUST AND WATER
MS Village 4	Millsell Village 4	S25.71405	E27.29709	2022-03-28 13:05	Yes	33 Days	DUST AND WATER
	Residential Dust Fallout Monitoring Locality						
	Non-Residential Dust Fallout Monitoring Locality						

Table 21: Waterkloof monthly sampling register for March 2022.

SAMPLING REGISTER : MONTHLY							
PROJECT NAME		Samancor Western Chrome Mine					
MONTH		March 2022					
SAMPLER NAME		Sibusiso Simelane					
Samancor Western Chrome Mine							
Locality	Description	Coordinates		Sample Time	Status	Dust Days	Remarks
		Latitude	Longitude				
Dust fallout							
WK East	Waterkloof East	S25.70139	E27.28176	2022-03-30 13:16	Yes	35 Days	DUST AND WATER
WK North	Waterkloof North	S25.69948	E27.27829	2022-03-30 12:44	Yes	35 Days	DUST AND WATER
WK North East	Waterkloof North East	S25.70028	E27.28007	2022-03-30 13:11	Yes	35 Days	DUST AND WATER
WK North West	Waterkloof North West	S25.69986	E27.27635	2022-03-30 13:47	Yes	35 Days	DUST AND WATER
WK South	Waterkloof South	S25.70330	E27.27841	2022-03-30 13:32	Yes	35 Days	DUST AND WATER
WK South East	Waterkloof South East	S25.70274	E27.28009	2022-03-30 13:26	Yes	35 Days	DUST AND WATER
WK South West	Waterkloof South West	S25.70244	E27.27656	2022-03-30 13:40	Yes	35 Days	DUST AND WATER
WK West	Waterkloof West	S25.70094	E27.27587	2022-03-22 16:54	Yes	27 Days	
	Residential Dust Fallout Monitoring Locality						
	Non-Residential Fallout Monitoring Locality						

Graphs of the dust fallout data gathered in March 2021 to March 2022 is presented below for the Millsell Site (Figure 20 and Figure 22) and for the Waterkloof Site (Figure 21).

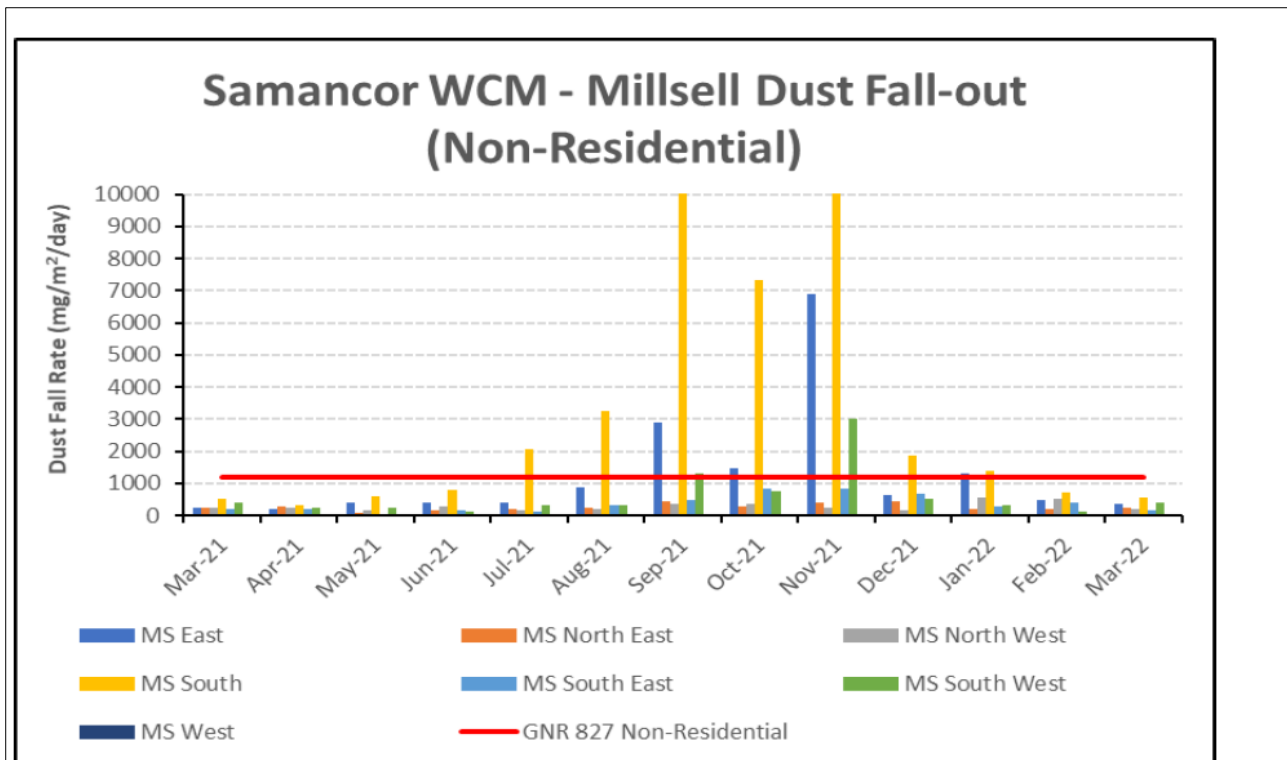


Figure 20: Samancor WCM – Millsell Mine, dustfall rate (non-residential/industrial), March 2021 to March 2022 (Aquatigo 2022)

Note that the graph (Figure 20) is set at a maximum y-axis value of 10 000 mg/m²/day for ease of illustration, however values recorded for MS South in September and November 2021 far exceeded this value.

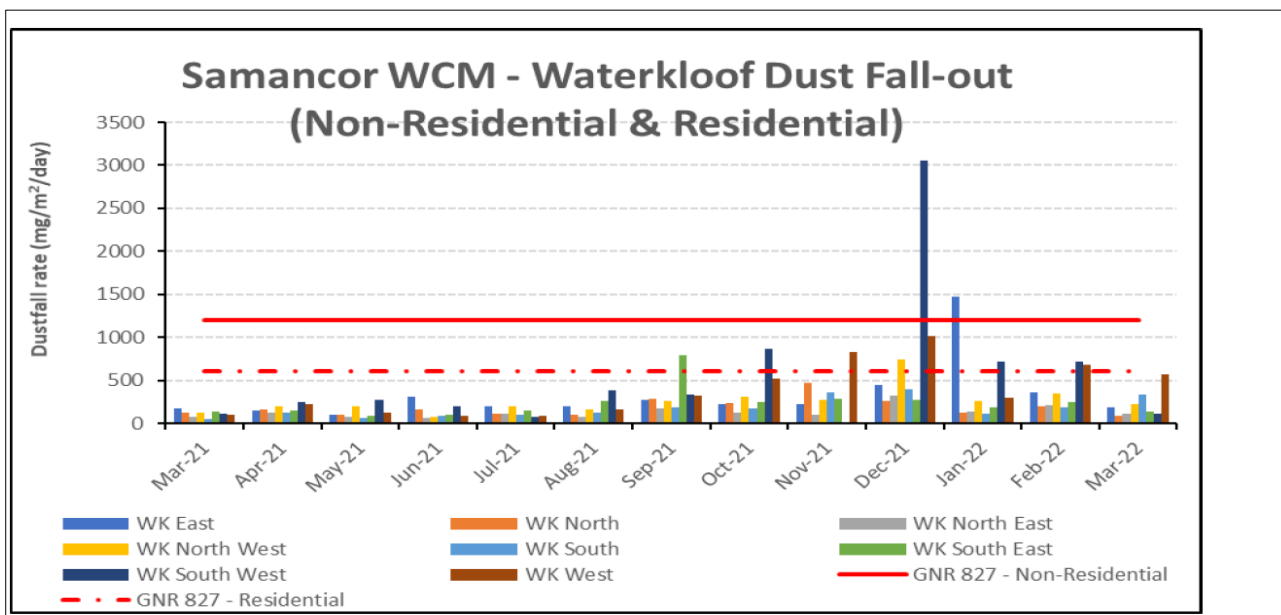


Figure 21: Samancor WCM – Waterkloof mine, dustfall rate (non-residential/industrial and residential), March 2021 to March 2022 (Aquatigo 2022)

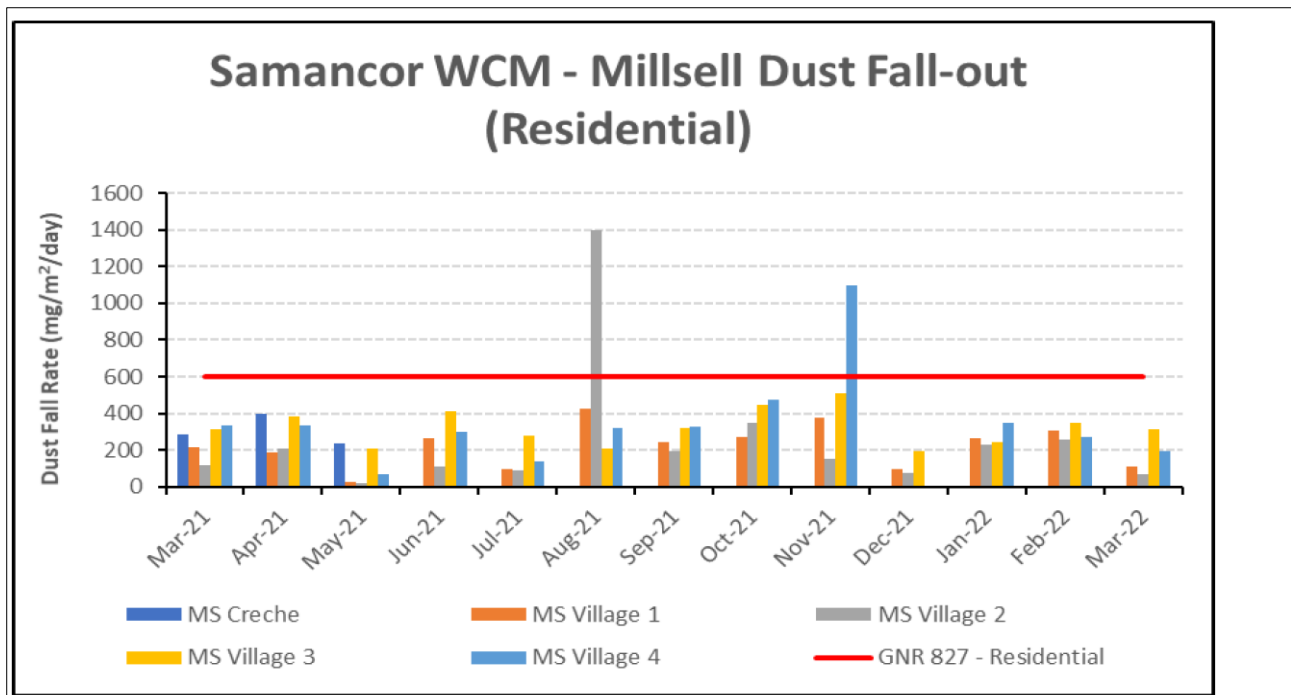


Figure 22: Samancor WCM – Millsell Mine, dustfall rate (residential), March 2021 to March 2022 (Aquatico 2022)

Non-Residential/Industrial Dust Fallout Monitoring

Several exceedances were recorded at the following sites and occasions: 'MS South' (February, July, September, October, November, December 2021 and January 2022), 'MS South West' (September 2021 and November 2021) and 'MS East' (September, October, November 2021 and January 2022). Extremely high fallout rates were visible at 'MS South' and tampering is suspected.

Furthermore, no data could be obtained at 'MS West' as the stand was stolen. Additionally, no exceedances were recorded in January, March, April, May and June of 2021 at any of the buckets. No exceedances were noted in March 2022. A focussed view of the surrounding area showed that the land towards the East and the South is mainly agricultural and residential in nature, which is likely attributing to high dust fall rates observed (probably due to increased traffic on dirt roads, agricultural activities, etc.). To the North-West, not only can agricultural and residential areas be identified, but also the Waterkloof Mine Operations.

The Waterkloof mining area is situated North West of the Millsell Section, however, the Waterkloof dust monitoring localities complied well with the proposed permissible non-residential/ industrial limits for dust fallout in March 2022. At the Waterkloof site, it is also evident that mainly residential and agricultural land lie within the dominant wind directions (blowing from), with industrial or mining activities scattered in the area, especially towards the North-West and South-West.

It should be noted that the residential limit (600 mg/m²/day) should also be considered at the 'WK West', 'WK North West' and 'WK South West' sites due to sensitive receptors in the vicinity. The dust bucket at 'WK South West' was stolen in November 2021.

Residential Dust Fallout Monitoring

This section focusses only on the Millsell and Waterkloof sites. The 'MS Creche', 'MS Village 1', 'MS Village 2', 'MS Village 3' & 'MS Village 4' dust monitoring localities are the only localities in this investigation that can be categorised into the Residential category at Millsell, along with 'WK West', 'WK North West' and 'WK South West' at Waterkloof.

The residential guideline limits contained in the GNR 827 (2013) are set at 600 mg/m²/day. A graph of the dust fallout data gathered in March 2021 to March 2022 is presented in Figure 22 above for the Millsell Site and Figure 21 for the Waterkloof Site.

Only three exceedances were recorded in the illustrated period above: 'MS Village 2' (August 2021) and MS Village 4 (November 2021). The 'MS Creche' stand was recorded as demolished in June 2021 as the stand was removed.

The dust fallout rate recorded at 'WK West' exceeded the residential limit in November 2021 (823 mg/m²/day), while this limit was also exceeded in December 2021 at 'WK North-West', 'WK South West' and 'WK West' and in January 2022 at 'WK East'. The 'WK West' and 'WK South West' sites exceeded the residential limit in February 2022. No exceedances were recorded in March 2022.

Three suggested monitoring stands were proposed for the Millsell Mine. A further two were suggested for the Waterkloof Mine. It was also recommended that a dust management plan and dust distribution model be assembled for the Millsell Mine (according to Sections (4) & (6) of the GNR 827 regulatory stipulations). This will ensure effective fallout monitoring surrounding sensitive receptors, in light of exceedances already recorded in previous months (2019 - 2021) at several monitoring stands. The approach could be taken at Waterkloof Mine as a pro-active approach. It was recommended that dust suppression be implemented for the areas where excessive dust fallout is recorded. Furthermore, it was suggested that the 'MS West' and 'MS Creche' dust stands be replaced immediately, in order to avoid gaps in the data.

7.12 NOISE

Mining and mining activities often emit significant noise levels which can become a nuisance or health risk when not properly managed. Not only to the mining area, but also to the surrounding land users and occupiers. The most sensitive receptors identified for the project area is the surrounding communities including land users, mine workers, mining communities and permanent farm homesteads and settlements. The region is predominantly occupied by mining and agricultural land uses.

The main noise generation activities of the project during all phases are:

- Construction phase:
 - Excavations;
 - Transportation of materials; and
 - Construction of water handling infrastructure.
- Operation phase:
 - Transportation of materials; and

- Offloading of materials.
- Closure or care and maintenance phase:
 - Limited number of vehicles moving around the site.

Noise generation can, therefore, be expected on the site due to various activities and actions as indicated above. Noise levels may possibly exceed allowed limits for noise as indicated in SANS 10103: 2008. The closest sensitive receptor (Kroondal) is located approximately 2 km away from the site and in conjunction with various, natural noise breaks, the noise perceived at the closest receptor, should be acceptable. It is, however, important to implement a noise monitoring programme to monitor noise levels and implement mitigation measures should the set limits be exceeded.

7.13 BLASTING ASSESSMENT

Blasting is common in the mining industry to remove overburden so that the exposed minerals can be mechanically excavated. The ground vibrations produced by blasting are often felt by residents surrounding the mines. The impacts related to blasting induced vibration, such as air blast, fly rock, dust, and fumes need to be evaluated. Their impact on structures, people and animals also needs to be evaluated.

The following mitigating measures are being implemented to minimise impacts associated with blasting and vibrations:

- A drilling and blasting standard operating procedure (SOP) shall be developed for the mine;
- A 20-m cut depth in the pit is mined so as to reduce the amounts of explosives used at any one time;
- A pre-and post-blast checklist is completed in by the responsible blaster and signed off by the responsible managers.
- Only single hole blasts are undertaken to reduce air blast and vibrations;
- Pre-spilt blasts are utilised to ensure the primary blast energy is contained within the blast area therefore reducing ground vibrations;
- Only a trained and certified blaster with certified blasting assistants are used;
- Blast designs are continuously re-evaluated according to prevailing conditions and geological conditions; and
- Climatic conditions and time of day are considered before a blast is undertaken.

7.14 VISUAL

It is important to bear in mind that determining a visual resource in absolute terms is not achievable. Evaluating a landscape's visual quality is both complex and challenging, as many quality standards apply and it is largely subjective, with individuals basing evaluations on experiences, their social level and their cultural background.

Furthermore, natural features are inherently variable. Climate, season, atmospheric conditions, region and subregion all affect the attributes that comprise the landscape. The main sources of visual impacts in the wider area is mining and industrial activities. The existing tailings facility and waste rock, overburden dump adjacent to the study area is the main source of visual impact in close proximity to the study area.

Visual Absorption Capacity (VAC) can be described as the ability of an area to absorb physical modifications.

Factors affecting VAC include inter alia, vegetation, the built environment, existing infrastructure and topography. In terms of these factors the receiving environment is perceived to have a low to medium VAC. The following have been identified as sensitive receptors in terms of visual impacts and impacts on the 'Sense of Place' of the study area and surrounding area:

- Travelers on the N4 Platinum Highway and the R104 provincial road adjacent to and within 2 km of the study area;
- Surrounding land users within 2 km from the study area; and
- Residents of the town of Rustenburg within 5 km of the study area.

7.15 ARCHAEOLOGY AND HERITAGE

According to the Phase 1 Archaeological Impact Assessment (Coetzee 2015) there are no visible archaeological remains within the demarcated study area, which was previously utilised for cultivation. Farmland borders on the study area to the north and west and there are two residential properties to the south of the study area.

The Southern African archaeology is broadly divided in the Early, Middle and Later Stone Ages; Early, Middle and Late Iron Ages; and Historical or Colonial Periods. The earlier stone tool industry comprises tools such as cobble cores and pebble choppers (Toth & Schick 2007). The Early Iron Age marks the movement of farming communities into South Africa in the first millennium AD, or around 2500 years ago (Mitchell 2002:259, 260). The groups were agro-pastoralist communities that settled in the vicinity of water in order to provide subsistence for their cattle and crops. The Historical period mainly originates from European discovery, settlement and impact on Southern Africa.

Some topics covered by the Historic period include the Dutch settlement in the Western Cape, early mission stations, Voortrekker routs and the Anglo Boer War. Early in the nineteenth century the Fokeng was present in the vicinity of present-day Rustenburg. Traditionally their territory stretched from the Magaliesberg in the south to probably the Elands River in the north. In the west their territory stretched from the Elands River to roughly the area where the Mogôpa-kwena resided near Sterkstroom in the east. Clashes with the Tlokwa, Kgafêla-Kgatla and the Pedi during the first two decades of the nineteenth century, however, weakened the position of the Fokeng. With the arrival of Mzilikazi shortly afterwards the Fokeng moved further in a southern direction across the Vaal River. Other groups that resided in the vicinity of Rustenburg. during these times were the Taung, Tlokwa, Po and Phiring (Bergh 1998: 106-107). The larger farm of Waterkloof 305 JQ, originally belonged to Paul Kruger during the early 1840s. Kruger resided on the farm until approximately 1873 when he moved to the farm Boekenhoutkloof. Accordingly, his farmstead on the Farm Waterkloof 305 JQ still exists. Also, a strong German community was established in the vicinity of the Hermansburg mission station on the Farm Kroondal (Van Schalkwyk 2007: 3). When the Magaliesberg congregation split from Potchefstroom in 1850, plans were made for the establishment of Rustenburg. The suggestion by Andries Pretorius to appoint a magistrate in Rustenburg was approved in January 1851 and P.J. van Staden was appointed (Bergh 1998b: 130).

7.16 SOCIO-ECONOMIC ENVIRONMENT

The Millsell and Waterkloof Section is situated near Rustenburg, approximately 100 km West of Pretoria, on the Western Limb of the Bushveld Igneous Complex, North West Province. The site falls within municipal boundaries of the Bojanala District Municipality and the Rustenburg Local Municipality (RLM) (Ward 34) (refer to Figure 23).

Rustenburg Local Municipality is accessible to a number of major South African urban centres including Johannesburg and Tshwane with Rustenburg being in close proximity to a number of smaller centres. It further act as a gateway to many regional tourist destinations, including the Pilanesberg National Park, Madikwe Game Reserve, Sun City and Lost City Resort, and the Cradle of Humankind. The Magaliesberg Mountain Range borders Rustenburg to the south-west with the Kgaswane Game Reserve located against the northern slopes of the Magaliesberg. RLM is known for its high concentration of mining activities especially within the PGM mining industry, and its agricultural sector.

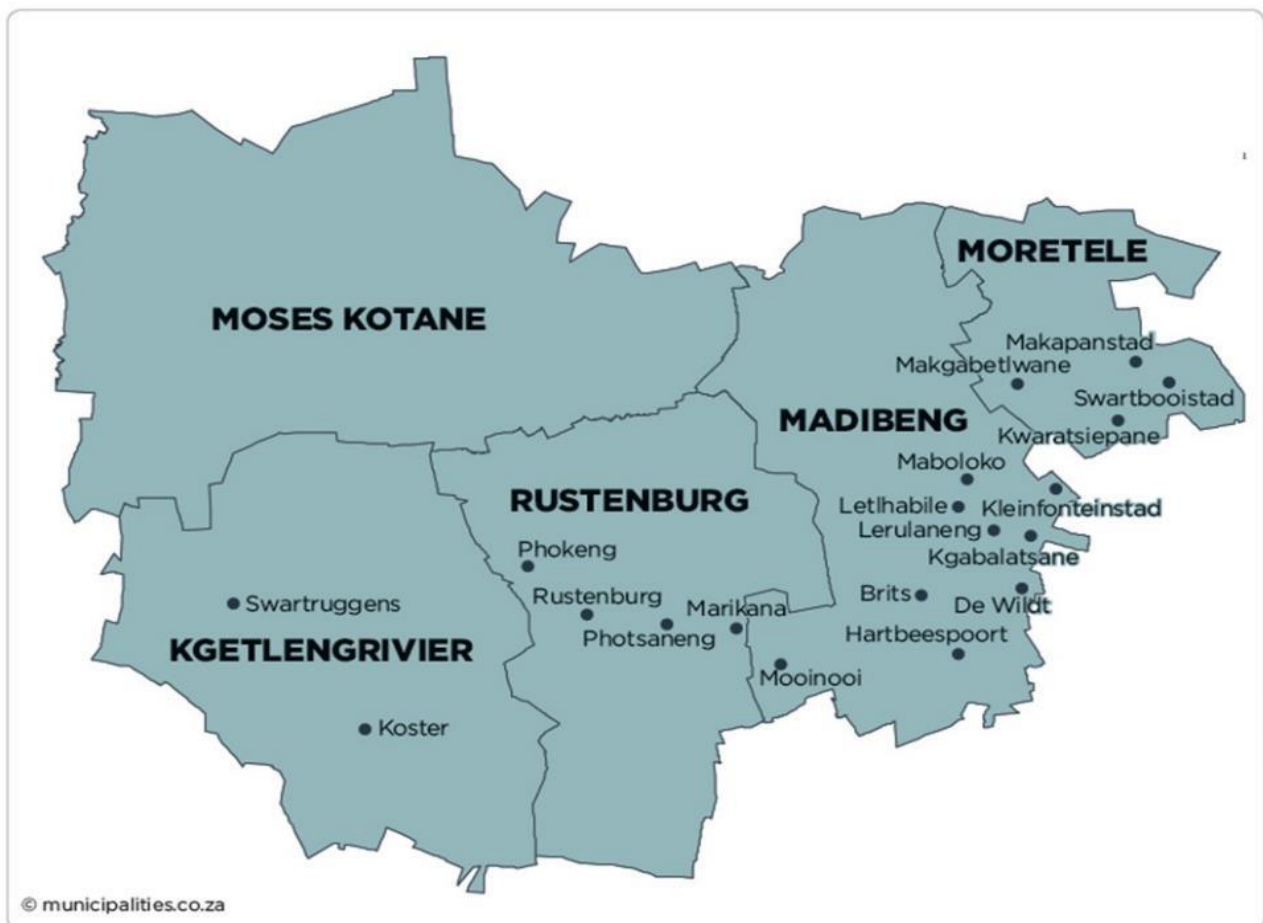


Figure 23: District and local municipalities of the North West Province

7.16.1 DEMOGRAPHICS

The demographic information for the RLM is provided in Table 22 below.

Table 22: Demographic Information (2011 Census; 2016 Community Survey) (Stats SA)

2016 Community Survey	
Total population	626 522
Male	342 865
Female	283 657
Youth (15-34 years)	35.9%
Male (15-34 years)	121 810
Female (15-34 years)	103 371
2011 Census	
Total population	549 575
Young (0-14)	24,1%
Working Age (15-64)	72,5%
Elderly (65+)	3,4%
Dependency ratio	37,9
Sex ratio	121,8
Growth rate	3,5% (2001-2011)
Population density	161 persons/km ²
Unemployment rate	26,4%
Youth unemployment rate	34,7%
No schooling aged 20+	5,4%
Higher education aged 20+	8,9%
Matric aged 20+	31%
Number of households	199,044
Number of Agricultural households	17,421
Average household size	2,5
Female headed households	26,4%
Formal dwellings	68,7%
Housing owned/paying off	31,4%
Flush toilet connected to sewerage	52,7%

Weekly refuse removal	69,2%
Piped water inside dwelling	35,8%
Electricity for lighting	83%

8 DESCRIPTION OF SPECIFIC ENVIRONMENTAL FEATURES AND INFRASTRUCTURE ON THE SITE

8.1 ENVIRONMENTAL FEATURES

The Waterkloof opencast mine is located outside of the Magaliesberg Biosphere Reserve and the Important Bird Area. As per the North West Biodiversity Sector Plan, the largest portion of the project area falls within a terrestrial CBA2 area, with sections indicated as an aquatic ESA2.

The Millsell-Waterkloof site is located within the Kroondal / Marikana Strategic Groundwater Source Area. It also lies within SANBI's Bushveld Bankenveld Biodiversity Priority Area. A channelled valley bottom wetland is also located within the project area. The project area is located close north-east of the Kgaswane Nature Reserve and North of the Magaliesberg Natural Protected Environment.

8.2 EXISTING INFRASTRUCTURE ON THE STUDY AREA AND IN CLOSE PROXIMITY

There is existing mining infrastructure in the project area, as described in Section 5. Other existing infrastructure includes residential areas, farmhouses and other agricultural infrastructure. The N4 highway and the R104 lie in close proximity to the project area.

9 IDENTIFICATION OF POTENTIAL IMPACTS

The scoping phase process is aimed to identify those potential impacts that are most likely to be significant and which need to be assessed as part of the process to acquire an EA. The determination of anticipated impacts associated with the activities conducted is a key component to the process. This Chapter identifies the perceived environmental and social effects associated with the activities conducted. The assessment methodology indicated in Section 4.4 and provided in Section 10.4.

The issues identified stem from those aspects presented in Section 7 of this document as well as project description provided. Each significant issue identified is to be investigated further if required. Non-significant issues will be scoped out of the study with reasonable consideration given within the Scoping Report.

9.1 CLIMATE

There will be limited expected changes to the climate due to the activities conducted and the main source was carbon emissions from machines, equipment and vehicles on the site during site clearance. The clearance of natural vegetation impacted the carbon storing potential of the area and hence influence climate change, however, to a small extent. No further studies are proposed.

9.2 GEOLOGY AND TOPOGRAPHY

No geological impacts such as sterilisation of mineral resources are expected as the project is being undertaken in a manner that allows for the maximum extraction of the targeted commodities within the project area. The construction was done as per approved engineering designs to limit the impact on the geology of the site. However, structural investigations would have been conducted by the engineering team prior to construction.

The topography of the project area would be altered by project related activities. The topography of the site could be altered through:

- Opencast mining; and
- alteration of drainage patterns.

No further studies are proposed.

9.3 WATER RESOURCES - SURFACE WATER

The discussion below considers surface water and focuses on possible impact associated with the project.

Issue: Reduction in surface water quantity and quality

The opencast mining area as well as the waste dump pads have the potential to negatively impact on water resources. Surface water impacts are associated with the processing of ore and disposal of waste onto temporary waste storage facilities. In the absence of mitigation measures, the direct impact on surface resources will be medium and the indirect impact high. With mitigation measures, the significance of the potential impacts can be reduced. During the operational phase, a dirty and clean stormwater system will be developed, thereby routing the contaminated stormwater into the pollution control dams. A stormwater attenuation system has been established on site.

9.4 WATER RESOURCES – GROUNDWATER

The discussion below considers groundwater and focuses on possible impact associated with the project.

Issue: Reduction in groundwater quantity and quality

Mining projects have the potential to negatively impact on water resources through abstraction for water supply and dewatering activities, regardless of the alternatives that are selected. Mining projects also present a number of emission sources that can have a negative impact on water quality. Contaminants from the project are expected to include operation related consumables, silt, fuels, hydrocarbons, residues, blasting equipment, sulphate pollution and hazardous wastes. Nitrate pollution associated with the mining method is anticipated.

In the absence of mitigation, given the importance of the groundwater system and based on the mine plan as presented in this report, the severity of unmitigated impacts would be high. Regarding water quantity impacts, where water resources are used by third party users, potential impacts affecting third party supply could occur. Impacts could extend beyond the site boundary to the water users and could extend beyond closure. In time, losses in water quantities and reduced water qualities could be reversed, however, at this stage, the related

time period is not known. The related unmitigated significance is high. Important to note is that the use or potential contamination of water resources is regulated through water use licensing requirements of the DWS as the custodian of water resources in South Africa. Where the project plan takes into account the findings of specialist studies, applies the necessary mitigation to avoid, minimises or remedy impacts in line with the mitigation hierarchy and operates under a water use license, the significance of potential impacts can be reduced.

9.5 BIODIVERSITY

In the broadest sense, biodiversity provides value for ecosystem functionality, aesthetic, spiritual, cultural, and recreational reasons. The known ecosystem related value is listed as follows:

- Soil formation and fertility maintenance;
- Primary production through photosynthesis, as the supportive foundation for life;
- Provision of food and fuel;
- Provision of shelter and building materials;
- Regulation of water flows and water quality;
- Regulation and purification of atmospheric gases;
- Moderation of climate and weather;
- Control of pests and diseases; and
- Maintenance of genetic resources (key for medicines, crop and livestock breeding).

The discussions below consider terrestrial and aquatic ecosystems.

Issue: Physical Loss and/or general disturbance of terrestrial biodiversity

The habitat units of the project area have been impacted on and degraded to some extent as a result agricultural and anthropogenic activities, however, the project area still contains habitat units which are considered to be ecologically sensitive. The mining activities have impacted on terrestrial biodiversity in the area where the opencast mine has been constructed.

Mitigation and management measures that will be identified by the specialist studies will be implemented, included in the EIA and EMP to ensure that the impact reduce.

A biodiversity impact assessment should be undertaken.

9.6 LAND USE

Issue: Impact on surrounding land uses

The dominant land use in the opencast area is agriculture with some residential houses and the surrounding mining activities. Project activities have impacted on these land uses in all phases, regardless of the alternatives were considered. These land uses may be affected by one or more of the biophysical, cultural and socio-economic impacts that could occur as a result of the project. In the absence of mitigation that focuses on

effectively mitigating each biophysical, cultural and socio-economic impact type, the severity would be medium; potential impacts would extend to the land uses located beyond the site boundary. The severity is likely to decrease with an increase in distance from the impact source. For the mining area, with mitigation in place, the duration of impacts would be linked to the life of the project. Where project planning takes into account the findings of the specialist study and applies the necessary mitigation to avoid, minimises or remedy impacts in line with the mitigation hierarchy, the significance of potential impacts could be reduced.

9.7 SOIL AND LAND CAPABILITY

Issue: Loss of soil and land capability through removal, erosion and compaction

Topsoil is generally a resource of high value containing a gene bank of vegetation seeds and other organisms. Soil resources can be lost through removal, erosion and compaction which can result in a loss of soil functionality as an ecological driver. The conservation of topsoil, soil management practises and the related rehabilitation strategy and initiatives become highly important in achieving the post-closure land use. A number of activities in all phases have the potential to result in the loss of soils and related land capability, regardless of the alternatives that are selected.

In the absence of soil conservation and management measures and a rehabilitation plan that supports the post closure land use, the severity of potential impacts is expected to be high due to the impacted nature of the project area. Without mitigation the loss of soil and related land capability would definitely occur. This impact significance could be reduced to medium/low with the implementation of mitigation measures focused on minimising impacts during operations and remedying any negative impacts at closure.

9.8 HERITAGE/CULTURAL RESOURCES AND PALEONTOLOGY

Issue: Loss of or damage to heritage

The opencast mining activities, in all phases prior to closure, have the potential to remove, damage or destroy heritage/cultural and palaeontological resources, either directly or indirectly, and may result in the loss of the resource for future generations. In the absence of mitigation measures, if the resources are considered to be of high heritage significance, the unmitigated severity could be high. The related unmitigated significance would be high. Where the project planning takes into account the findings of the specialist studies and either avoids resources of high significance or alternatively document and/or relocate resources in line with a permit or the necessary approvals the significance of potential impacts can be reduced.

There are existing heritage impact assessment studies in place. The palaeontology of the area is considered to be low.

9.9 BLASTING, VIBRATION AND NOISE

Issue: Blasting and vibration related impacts

The mining method involves drill and blasting. Blasting activities have the potential to impact on people, animals and structures located in the vicinity of the project area.

The potential impact could have a medium severity in the unmitigated scenario. In the mitigated scenario, this severity will remain medium. A number of measures can be taken to control blasts and associated impacts.

A noise study will be undertaken.

9.10 VISUAL

The study area is moderately populated, with a higher population located in the town and cities close to the study site. The Magaliesburg mountain range is located close to the project area while the N4 highway runs close to the site. Visual impacts could be high close to sensitive receptors. Further studies should be undertaken.

9.11 AIR QUALITY

The construction activities required clearance of the project area, which in turn required stockpiling of material. During the operational phase, the opencast mine area has resulted in additional dust emissions. As such, this impact from the project area would need to be mitigated.

Further studies should be conducted with the AQIA undertaken for such activities.

9.12 TRAFFIC

Issue: Effect on roads due to project related traffic

Mining projects contribute to increased traffic and introduce mine-related trucks on public road networks which can result in an inconvenience to current road users, higher accidents (for people and animals) decreased road service levels and/or increased road damage. This in turn can put pressure on the relevant roads authority to increase the maintenance programmes and/or upgrade the roads.

In the absence of active mining activities, traffic volumes along the secondary road and the N4 are generally high and mostly limited to light vehicles (rather than heavy vehicles that would be generated by the mining operation). Regardless of the alternatives that are selected, the project would contribute to traffic volumes on public roads. Traffic impacts are expected from construction through to the end of the decommissioning phase.

In the absence of mitigation measures that take into account other road uses and users, project-related use of public roads could result in a high severity impact. Any serious injury or death is a long-term impact that would extend to the communities to which injured people/animals belong. The related unmitigated significance is high. With mitigation that focuses on ensuring adequate capacity on the road network and safety measures for other

road users, the significance could reduce to medium as the severity, duration and frequency of potential accidents is expected to reduce.

The project does not make use of public roads, therefore, no traffic impact assessment will be undertaken.

9.13 SOCIO-ECONOMIC

Issue: Positive and negative socio-economic impacts

Mining projects have the potential to have positive and/or negative impacts on the following, regardless of the alternatives that are selected:

- Continued employment for current workers;
- the local and national economy;
- social structures within communities;
- increased pressure on basic services;
- quality of life and health related issues
- livelihoods of businesses

Socio-economic impacts would occur during all project phases. In the absence of mitigation that focuses on enhancing positive impacts and reducing negative impacts, the severity of unmitigated impacts would be medium for negative impacts and medium (positive) for positive impacts. The related unmitigated significance could be medium. Where the project planning takes into account and applies the necessary mitigation to avoid, minimises or remedy impacts in line with the mitigation hierarchy, the significance of potential negative impacts can be reduced and potential positive impacts can be increased.

9.14 SUMMARY OF IMPACTS

The potential environmental and social impacts are described in Table 23 to Table 25 below. The construction impacts identified in Table 23 are assumed to have already taken place during construction phase of the project and will not be further assessed in the EIA.

Table 23: Impacts during the Construction phase – activity specific impacts

ACTIVITY	ENVIRONMENTAL ASPECT	DESCRIPTION OF IMPACT	SIGNIFICANCE PRE-MITIGATION	PROBABILITY	DURATION
IMPACTS DURING THE CONSTRUCTION PHASE					
GENERAL IMPACTS					
Site preparation	GEOLOGICAL AND SOILS	Soil erosion and soil compaction by heavy duty vehicles on site.	Medium (-)	Possible	Medium term
		Loss of topsoil	High (-)	Definite	Long term
		Vehicle and personnel as well as storage of materials, equipment and stockpiling compaction and degradation impacts.	Medium (-)	Possible	Medium term
		Contamination of soils through: <ul style="list-style-type: none"> - Indiscriminate disposal of waste; and - Accidental spillage of chemicals such as hydrocarbon-based fuels and oils or lubricants spilled from vehicles and other chemicals from operational and maintenance activities e.g., paints. 	Medium (-)	Possible	Medium term
	HYDROLOGICAL SURFACE WATER AND GROUNDWATER	Stormwater, erosion and siltation impacts due to a lack of implementing measures to manage stormwater run-off quantity and quality during the operational phase.	Medium (-)	Possible	Long term
		Contamination of stormwater runoff and ground water, caused by: <ul style="list-style-type: none"> - Sediment release; - Chemicals such as hydrocarbon-based fuels and oils or lubricants spilled from construction vehicles; - Other chemicals from maintenance activities e.g., paints; and - Effluent discharges, due to a lack of stormwater management and system maintenance. - Surface mining and blasting – Nitrate pollution 	Medium (-)	Possible	Long term

ACTIVITY	ENVIRONMENTAL ASPECT	DESCRIPTION OF IMPACT	SIGNIFICANCE PRE-MITIGATION	PROBABILITY	DURATION
IMPACTS DURING THE CONSTRUCTION PHASE					
GENERAL IMPACTS					
		Altered drainage patterns and stormwater runoff flows.	Medium (-)	Probable	Long term
	BIOLOGICAL, FAUNA, AVIFAUNA AND FLORA	Disturbance and loss of fauna through noise, light and dust pollution and hunting, trapping and killing of fauna.	Low (-)	Unlikely	Medium Term
		Spreading of alien invasive species and bush encroachment of indigenous species.	Medium (-)	Possible	Long term
		Loss of biodiversity as a result of vegetation clearing for infrastructure	Low (-)	Possible	Long term
	LAND USE	Change in land use as a result of mining activities.	High (-)	Definite	Long term
	VISUAL	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 including the waste management facilities and mining activities.	Medium (-)	Definite	Medium term
	NOISE, VIBRATION AND LIGHTING	Nuisance and health risks caused by an increase in the ambient noise level as a result of noise impacts associated with the operation of the mining activities and processing.	Low (-)	Definite	Medium term
		Disturbance due to vibrations caused by vehicles.	Low (-)	Definite	Medium term
		Impact of security lighting on surrounding landowners and animals.	Low (-)	Definite	Long term
		Blasting and vibration related impacts (air blasts, ground vibration and fly rock)	High (-)	Possible	Medium term

ACTIVITY	ENVIRONMENTAL ASPECT	DESCRIPTION OF IMPACT	SIGNIFICANCE PRE-MITIGATION	PROBABILITY	DURATION
IMPACTS DURING THE CONSTRUCTION PHASE					
GENERAL IMPACTS					
	AIR QUALITY	Increased dust pollution (soil and ore fines), vehicles on gravel roads and waste rock, overburden, as well as other mining and processing activities.	Medium (-)	Definite	Long term
		Increased windborne dust (soil and ore fines), vehicle fumes and particulate matter PM10, altering air quality.	Medium (-)	Definite	Medium term
	WASTE (INCLUDING HAZARDOUS WASTE)	Generation and disposal of general waste, litter and hazardous material during the operational phase and operational waste i.e., waste rock, etc.	Medium (-)	Definite	Medium term
	SERVICES	Need for services e.g., water, electricity and sewerage systems, causing additional strain on natural resources and service infrastructure.	Low (-)	Unlikely	Long term
	TRAFFIC	The change in the traffic patterns as a result of increased traffic entering and exiting the operations on the surrounding road infrastructure and existing traffic.	Medium (-)	Definite	Long term
		Nuisance, health and safety risks caused by increased traffic on an adjacent to the study area including cars and heavy vehicles.	Medium (-)	Possible	Long term
	HEALTH AND SAFETY	Possibility of mining activities and workers causing veld fires, which can potentially cause injury and or loss of life to mine workers and surrounding landowners, visitors and workers.	Medium (-)	Possible	Long term
		Increased risk to public health and safety: Dangerous areas including the waste management activities and waste poses health risks and possible loss of life to mine workers and visitors to the site.	Medium (-)	Possible	Long term

ACTIVITY	ENVIRONMENTAL ASPECT	DESCRIPTION OF IMPACT	SIGNIFICANCE PRE-MITIGATION	PROBABILITY	DURATION
IMPACTS DURING THE CONSTRUCTION PHASE					
GENERAL IMPACTS					
	SOCIO-ECONOMIC	Socio-economic impact on farmers, labourers and surrounding landowners and residents due to negative impacts on groundwater, dust pollution, noise pollution etc.	Medium (-)	Definite	Long term
		Extended employment provision due to the implementation of the extension of the mining activities, allowing mining activities to continue for additional years.	High (+)	Definite	Medium to Long term
		Sourcing supplies from local residents and businesses boosting the local economy for an extended period of time.	Medium (+)	Possible	Long term

Table 24: Impacts during the Operational phase – activity specific impacts

ACTIVITY	ENVIRONMENTAL ASPECT	DESCRIPTION OF IMPACT	SIGNIFICANCE PRE-MITIGATION	PROBABILITY	DURATION
IMPACTS DURING THE OPERATIONAL PHASE					
ACTIVITY SPECIFIC IMPACTS					
Opencast Mining	HYDROLOGICAL, SURFACE WATER, WETLANDS AND GROUNDWATER	Impact of Nitrate based explosives used during mining on groundwater quality. Contamination plume can affect the groundwater resource.	Medium (-)	Definite	Long term
		Impacts of dewatering on the groundwater aquifer should water be abstracted from ground water during the operational phase.	Medium (-)	Probable	Long term
		Groundwater contamination from storage of operational materials and hydrocarbons.	Medium (-)	Definite	Long term

ACTIVITY	ENVIRONMENTAL ASPECT	DESCRIPTION OF IMPACT	SIGNIFICANCE PRE-MITIGATION	PROBABILITY	DURATION
IMPACTS DURING THE OPERATIONAL PHASE					
ACTIVITY SPECIFIC IMPACTS					
		Contamination of stormwater runoff and ground water, caused by: - Sediment release; - Chemicals such as hydrocarbon-based fuels and oils or lubricants spilled from construction vehicles; - Other chemicals from maintenance activities e.g., paints; and - Effluent discharges, due to a lack of stormwater management and system maintenance.	Medium (-)	Definite	Long term
	WASTE	Generation and disposal of additional hazardous operational waste i.e., waste rock overburden etc.	Medium (-)	Definite	Long term
	ARCHAEOLOGICAL/ HERITAGE RESOURCES	Alteration of archaeological, historical and palaeontological resources that may be discovered during earthworks.	Low (-)	Possible	Permanent
	HEALTH AND SAFETY	Increased risk to public and worker health and safety.	Medium (-)	Possible	Permanent
	SOCIO-ECONOMIC	Extended employment provision due to the implementation of the extension of the mining activities, allowing mining activities to continue for additional years.	High (+)	Definite	Long term
	VIBRATION	Blasting and vibration related impacts (air blasts, ground vibration and fly rock)	High (-)	Possible	Medium term
Loading and hauling to Plant	HYDROLOGICAL, SURFACE WATER AND GROUNDWATER	Possible impact on surface and groundwater from contaminated process water.	Low (-)	Probable	Long term
		Possible impact of spills and overflows from pollution control dams and facilities.	low (-)	Possible	Medium term

ACTIVITY	ENVIRONMENTAL ASPECT	DESCRIPTION OF IMPACT	SIGNIFICANCE PRE-MITIGATION	PROBABILITY	DURATION
IMPACTS DURING THE OPERATIONAL PHASE					
ACTIVITY SPECIFIC IMPACTS					
	WASTE	Generation and disposal of additional hazardous operational waste i.e., waste rock etc.	Medium (-)	Definite	Long term
	AIR QUALITY	Increased dust pollution (soil and ore fines), vehicles on gravel roads and transport of chrome	Medium (-)	Definite	Long term
		Increased windborne dust (soil and ore fines), vehicle fumes and particulate matter PM10, altering air quality.	Medium (-)	Definite	Long term
	HEALTH AND SAFETY	Increased risk to public and worker health and safety.	Medium (-)	Possible	Permanent
	SOCIO-ECONOMIC	Extended employment provision due to the implementation of the extension of the mining activities, allowing mining activities to continue for additional years.	High (+)	Definite	Long term
	VIBRATION	Increase in vibration as a result of heavy equipment and processing plant.	Low (-)	Possible	Medium term
Processing of RoM	HYDROLOGICAL SURFACE WATER AND GROUNDWATER	Impact on surface and groundwater from contaminated process water.	Low (-)	Probable	Long term
		Impact of spills and overflows from pollution control dams and facilities.	low (-)	Possible	Medium term
	WASTE	Generation and disposal of additional hazardous operational waste i.e., waste rock, tailings, etc.	Medium (-)	Definite	Long term
	HEALTH AND SAFETY	Increased risk to public and worker health and safety.	Medium (-)	Possible	Permanent

ACTIVITY	ENVIRONMENTAL ASPECT	DESCRIPTION OF IMPACT	SIGNIFICANCE PRE-MITIGATION	PROBABILITY	DURATION
IMPACTS DURING THE OPERATIONAL PHASE					
ACTIVITY SPECIFIC IMPACTS					
	AIR QUALITY	Increased windborne dust (soil and ore fines), vehicle fumes and particulate matter PM10, altering air quality.	Medium (-)	Definite	Long term
	SOCIO-ECONOMIC	Employment opportunities due to the implementation of the of the mining activities.	High (+)	Definite	Long term
Maintenance of the waste rock, overburden dumps.	HYDROLOGICAL, SURFACE WATER AND GROUNDWATER	Seepage from waste management activities e.g., waste rock dumps, could cause a contamination plume affecting the underground water resources.	Medium (-)	Probable	Long term
		Discharge from tailings and associated water handling infrastructure can cause contamination of surface water resources.	Medium (-)	Probable	Long term
		Impact on surface and groundwater quality as a result of oxidation of sulphates from the tailings and waste rock placed back in put as part of rehabilitation	Medium (-)	Definite	Long term
	WASTE	Generation and disposal of additional hazardous operational waste i.e., waste rock, tailings, etc.	Medium (-)	Definite	Long term
	AIR QUALITY	Increased windborne dust (soil and ore fines), vehicle fumes and particulate matter PM10, altering air quality.	Medium (-)	Definite	Long term
	HEALTH AND SAFETY	Increased risk to public and worker health and safety.	Medium (-)	Possible	Permanent
	SOCIO-ECONOMIC	Economic impact should there be an incident of public health and safety.	Medium (-)	Possible	Long term

ACTIVITY	ENVIRONMENTAL ASPECT	DESCRIPTION OF IMPACT	SIGNIFICANCE PRE-MITIGATION	PROBABILITY	DURATION
IMPACTS DURING THE OPERATIONAL PHASE					
ACTIVITY SPECIFIC IMPACTS					
Transport of ROM to market	HYDROLOGICAL, SURFACE WATER AND GROUNDWATER	Increase in surface water pollution as a result of spills and transport of ore.	Low (-)	Probable	Medium term
	AIR QUALITY	Increased windborne dust (soil and ore fines), vehicle fumes and particulate matter PM10, altering air quality.	Medium (-)	Definite	Long term
	HEALTH AND SAFETY	Increased risk to public and worker health and safety.	Medium (-)	Possible	Permanent
	SOCIO-ECONOMIC	Sourcing supplies from local residents and businesses boosting the local economy for an extended period of time.	Medium (+)	Possible	Long term
	VIBRATION	Disturbance due to vibrations caused by heavy duty vehicles.	Low (-)	Probable	Long term
	TRAFFIC	The change in the traffic patterns as a result of increased traffic entering and exiting the operations on the surrounding road infrastructure and existing traffic.	Medium (-)	Definite	Medium term
Nuisance, health and safety risks caused by increased traffic on an adjacent to the study area including cars and heavy vehicles.		Medium (-)	Possible	Medium term	

Table 25: Impacts during the Closure phase – general impacts

ACTIVITY	ENVIRONMENTAL ASPECT	DESCRIPTION OF IMPACT	SIGNIFICANCE PRE-MITIGATION	PROBABILITY	DURATION
IMPACTS DURING THE CLOSURE AND POST-CLOSURE PHASES					
GENERAL IMPACTS					
Removal of surface infrastructure and rehabilitation of opencast mine	GEOLOGICAL AND SOILS	Soil compaction by heavy duty vehicles.	Medium (-)	Possible	Medium term
		Contamination of soils through: <ul style="list-style-type: none"> - Accidental spillage of chemicals such as hydrocarbon-based fuels and oils or lubricants spilled from heavy duty vehicles and other chemicals. 	Medium (-)	Possible	Short term
	HYDROLOGICAL, SURFACE WATER AND GROUNDWATER	Stormwater, erosion and siltation impacts due to a lack of implementing measures to manage stormwater run-off quantity and quality during the closure phase.	Medium (-)	Possible	Medium term
		Contamination of stormwater runoff and ground water, caused by: <ul style="list-style-type: none"> - 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	Medium term
		Impacts of dewatering on the groundwater aquifer should water be abstracted from ground water during the closure phase.	Medium (-)	Possible	Medium term
		Seepage from waste management facilities could cause a contamination plume affecting the underground water resources.	Medium (-)	Possible	Long term
		Impact on surface flow as a result of new topography after rehabilitation	Medium (-)	Possible	Long term
		Decrease in groundwater quality as a result of pollution plume	Medium (-)	Possible	Long term

ACTIVITY	ENVIRONMENTAL ASPECT	DESCRIPTION OF IMPACT	SIGNIFICANCE PRE-MITIGATION	PROBABILITY	DURATION
IMPACTS DURING THE CLOSURE AND POST-CLOSURE PHASES					
GENERAL IMPACTS					
	BIOLOGICAL	Disturbance and loss of fauna through noise, light and dust pollution as well as hunting, trapping and killing of fauna.	Low (-)	Definite	Long term
		Spreading of alien invasive species and bush encroachment of indigenous species.	Medium (-)	Possible	Long term
	VISUAL	Visibility from sensitive receptors / visual scarring of the landscape as a result of the closure and rehabilitation activities.	Low (-)	Definite	Medium term
		Visibility of solid domestic and operational waste.	Low (-)	Possible	Medium term
	NOISE, VIBRATION AND LIGHTING	Nuisance and health risks 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	Medium term
		Disturbance due to vibrations caused by heavy duty vehicles.	Low (-)	Probable	Medium term
		Impact of security lighting on surrounding landowners and animals.	Low (-)	Definite	Medium term
	AIR QUALITY	Dust (soil and ore fines) pollution due to rehabilitation activities and heavy-duty vehicles.	Medium (-)	Definite	Long term
		Windborne dust (soil and ore fines) and vehicle fumes and particulate matter PM10, altering air quality.	Medium (-)	Definite	Long term
	SERVICES	Need for additional services i.e., water, electricity and sewerage systems during the closure phase causing additional strain on natural resources and infrastructure.	Low (-)	Unlikely	Short term

ACTIVITY	ENVIRONMENTAL ASPECT	DESCRIPTION OF IMPACT	SIGNIFICANCE PRE-MITIGATION	PROBABILITY	DURATION
IMPACTS DURING THE CLOSURE AND POST-CLOSURE PHASES					
GENERAL IMPACTS					
	TRAFFIC	The change in the traffic patterns as a result of traffic entering and exiting the mine on the surrounding road infrastructure and existing traffic.	Low (-)	Possible	Medium term
		Nuisance, health and safety risks caused by increased traffic on an adjacent to the study area including cars and heavy vehicles.	Low (-)	Possible	Medium term
	HEALTH AND SAFETY	Possibility of closure activities and workers causing veld fires, which can potentially cause injury and or loss of life to workers and surrounding landowners and visitors.	Low (-)	Possible	Medium term
		Increased risk to public health and safety: Dangerous areas including the waste management facilities poses health risks and possible loss of life to mine workers and visitors to the site.	Medium (-)	Possible	Long term
		Increased risk to public and worker health and safety.	Medium (-)	Possible	Long term
	SOCIO-ECONOMIC	Socio-economic impact on farmers, labourers and surrounding landowners and residents due to negative impacts on groundwater, dust pollution, noise pollution etc.	Medium (-)	Definite	Long term
		Economic impact should there be an incident of public health and safety.	Medium (-)	Possible	Medium term
		Sourcing supplies from local residents and businesses boosting the local economy for an extended period of time.	Medium (+)	Possible	Long term

Table 26: Closure and post-closure specific impacts

ACTIVITY	ENVIRONMENTAL ASPECT	DESCRIPTION OF IMPACT	SIGNIFICANCE PRE-MITIGATION	PROBABILITY	DURATION
IMPACTS DURING THE CLOSURE AND POST-CLOSURE PHASES					
PHASE SPECIFIC IMPACTS					
Rehabilitation of site, removal of infrastructure, re-seeding of rehabilitated areas.	GEOLOGICAL AND SOILS	Soil erosion, loss of agricultural potential, insufficient topsoil quality and quantity, ineffective soil amelioration resulting in poor vegetation establishment, compaction and loss of topsoil, excessive dust from unvegetated areas.	Medium (-)	Definite	Long term
	HYDROLOGICAL, SURFACE WATER AND GROUNDWATER	Changes in surface hydrology, seepage from waste rock and tailings could cause a contamination plume affecting the groundwater resources.	Medium (-)	Probable	Long term
		Ground water pollution	Medium (-)	Probable	Long term
	WASTE	Generation and disposal of additional hazardous operational waste i.e., waste rock and tailings.	Medium (-)	Definite	Long term
	BIOLOGICAL, FAUNA AND FLORA	Rehabilitation of area with natural vegetation and re-establishment of local biodiversity	Medium (-)	Definite	Long term
		Loss of ecological function in wetland, pans and stream	Medium (-)	Possible	Long term

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

Table 27 provides possible mitigation measures that should be implemented to reduce the potential impacts.

Table 27: Mitigation measures (Operational and Closure Phase)

Activity	Potential Impact	Possible mitigation	Potential for residual risk
Opencast mining and establishment of access roads Waste Rock, overburden Dump and RoM stockpiles	Physical loss and/or general disturbance of terrestrial biodiversity	<ul style="list-style-type: none"> • Avoid sensitive areas as far as practically possible. • Implementation of an alien invasive species programme. • Limit emissions (dust, light, noise). • Training of employees on the value of biodiversity. • Zero tolerance for harming and harvesting fauna and flora. • Effective waste management and pollution prevention. • Effective rehabilitation to achieve post closure land use. 	Medium
Transport and processing of chrome. Rehabilitation of area. General Site activities.	Reduction in surface water quantity and quality.	<ul style="list-style-type: none"> • Design and implement contamination containment measures. • Mine infrastructure must be operated so as to comply with the National Water Act No. 36 of 1998 and Regulation 704 (4 June 1999): <ul style="list-style-type: none"> ○ Clean and dirty water system will be separate. ○ Clean run-off will be diverted away from the site. ○ Dirty water will be contained. ○ The necessary exemptions and approvals will be obtained for activities and infrastructure located within 100 m or within the 1:100-year floodline of the water courses. • Conduct surface water monitoring and implement remedial actions as required. • Effective equipment and vehicle maintenance. • Fast and effective clean-up of spills. • Effective waste management. • Education and training of workers. • Implement WUL requirements and mitigation measures • Effective rehabilitation to achieve post closure land use. 	Medium
	Reduction in groundwater quantity and quality.	<ul style="list-style-type: none"> • Groundwater pollution will be identified and included into a groundwater management plan which will be implemented as part of the operational and closure phase 	Medium

Activity	Potential Impact	Possible mitigation	Potential for residual risk
		<ul style="list-style-type: none"> • Implement WUL requirements and mitigation measures. • Conduct groundwater monitoring and implement remedial actions as required. This includes compensation for mine related loss of third-party water supply. • Effective equipment and vehicle maintenance. • Fast and effective clean-up of spills. 	
	Blasting and vibration related impacts	<ul style="list-style-type: none"> • Develop and implement a vibration and blast management plan which addresses vibration and blast design criteria to limit ground vibration. • Remediation of all impacts caused by vibration and blasting. 	Medium
	Positive and negative socio-economic impacts	<ul style="list-style-type: none"> • Develop and implement procedures for recruiting, training and procurement that align with good industry practise (SLP). • Employ local people and procure goods and services locally as far as practically possible. • Effective communication to manage expectations with regard to employment and other opportunities. • Ensure that closure planning considerations address the re-skilling of employees for the downscaling, early closure and long-term closure scenarios. • Work together with communities to manage issues such as security. 	Medium
	Negative visual impacts	<ul style="list-style-type: none"> • Limit the extent of disturbed areas. • Suppress dust to prevent a visual dust cloud. • Effective waste management. • Implement effective use of lighting which reduces light spill. • Effective rehabilitation to achieve post closure land use. • The use of berms where appropriate. 	Low
	Loss and sterilisation of mineral resources	<ul style="list-style-type: none"> • Incorporate cross discipline planning to avoid mineral sterilisation. A key component of the cross-cutting function is the Mine resource manager. 	Low
	Loss of soil and land capability through removal, erosion and compaction	<ul style="list-style-type: none"> • Limit site clearance to what is absolutely necessary for the immediate future mining area. • Strip, handle, stockpile and re-use soil resources in line with site specific soil conservation and management plan. 	Medium
	Physical loss and/or general disturbance of terrestrial	<ul style="list-style-type: none"> • Undertake pre-construction surveys of the development footprints for species suitable for search and rescue operations. 	Medium

Activity	Potential Impact	Possible mitigation	Potential for residual risk
	biodiversity and aquatic ecosystems	<ul style="list-style-type: none"> • Avoid sensitive areas as far as practically possible. • Obtain relevant permits prior to removal of protected species. • Implementation of an alien invasive species programme. • Limit emissions (dust, light, noise). • Training of employees on the value of biodiversity. • Zero tolerance for harming and harvesting fauna and flora. • Effective waste management and pollution prevention. • Effective rehabilitation to achieve post closure land use. 	
	Increase in Noise and Air pollution	<ul style="list-style-type: none"> • Maintain vehicles and equipment in good working order. • Provide noise berms where possible between activities and receptors. • Conduct noise monitoring in response to noise complaints. • Limit disturbed areas. • Suppress dust effectively. • Maintain equipment and vehicles in good working order. • Monitor pollutants of concern and implement additional mitigation as required. • Effective rehabilitation to achieve post closure land use. • Undertake a carbon footprint assessment. 	Medium/Low
	Effect on roads due to project related traffic	<ul style="list-style-type: none"> • Construct safe access points/intersections. • Educate employees (temporary and permanent) about road safety. • Enforce strict vehicle speeds. • If a person or animal is injured by transport activities an emergency response procedure must be implemented. 	Medium
	Change in land use affecting surrounding land uses	<ul style="list-style-type: none"> • Effectively manage biophysical, cultural and socio-economic impacts. • Effectively rehabilitate infrastructure area in line with an approved rehabilitation plan that meets the post closure land use objectives and ensure successful rehabilitation as soon as mining is complete. • Establish a stakeholder communication and grievance mechanisms for the duration of the mining operation. 	Medium

10 PLAN OF STUDY FOR THE ENVIRONMENTAL IMPACT ASSESMENT PROCESS

This plan of study for the EIAR is indicated in the sections below.

10.1 DESCRIPTION OF ALTERNATIVES

The EIA process identifies two types of project alternatives:

- Concept Level Alternatives which relates to the site, technology and process alternatives; and
- Detailed Level Alternatives which relates to working methods and mitigation measures,

The feasibility of the higher level concept alternatives have been considered and assessed within Section 8 of the DSR. The Detailed Alternatives, if any are required by the CA, will be addressed within the EIAR.

10.2 SPECIALIST STUDIES TO BE UNDERTAKEN

This section lists the aspects to be subjected to specialist investigation in the EIA phase in line with the terms of reference outlined in Table 28 below. These include:

- Soils and Land capability, including Agricultural Potential Assessment
- Terrestrial Fauna and Flora (Biodiversity) Assessment (Plant and Animal Assessment);
- Landscape/Visual Impact Assessment;
- Terrestrial Biodiversity (Fauna and Flora) Impact Assessment (Plant and Animal Assessment);
- Surface Water (Hydrology) Assessment and Aquatic Assessment;
- Geohydrological Impact Assessment;
- Noise Impact Assessment;
- Air Quality Impact Assessment;
- Closure and Rehabilitation Plans (including Financial Provisioning);and

This section describes the nature and extent of the investigations required. In particular, it describes the scope of work for the specialist investigations.

10.3 DESCRIPTION OF ASPECTS TO BE ASSESSED BY SPECIALISTS

Table 28 provides a description of the aspects to be assessed by the various specialists for the Waterkloof Opencast Mine S24G Project.

Table 28: Description of aspects to be assessed by specialists

Aspect	Specialist Study	Specialist	Terms of Reference
Surface water and Aquatic Ecology	Surface Water (Hydrology) Assessment	Red Kite Environmental Solutions (Pty) Ltd.	<p>The scope of the surface water baseline and impact assessment study will be to:</p> <ul style="list-style-type: none"> • A desktop review of available information for the project area, including satellite images, databases and specialist studies performed for the areas; • Identify impactable water resources, with their accompanying catchments, and sub-catchment areas as well as setting forth information on which measures and legislation will be applicable to the project; • A field visit to survey the affected watercourses; • If site conditions allow, two monitoring sites in the potentially affected rivers / streams will be assessed for the aquatic assessment, the following methodology will be used: <ul style="list-style-type: none"> ○ SASS5 (South African Scoring System version 5), ○ IHAS (Invertebrate Habitat Assessment system), and ○ Upstream and downstream water quality sampling (2 samples). • Determine or recommend ranges of acceptability for water quality for affected watercourses and compare to existing water quality monitoring data; • Describe riparian vegetation associated with identified surface water resources; • Determination of watercourse buffers as per Buffer Zone Guidelines for Wetlands, Rivers and Estuaries by Macfarlane and Bredin (2017); • Surface Water Assessment Report describing the affected surface water environment and condition; • NEMA 2014 impact assessment; • Developing a sensitivity map based on field visits and supported by appropriate regional information to inform the impact assessment; • Recommendation of site-specific mitigation measures; and • Compilation of a specialist surface water and aquatic ecology assessment report for the development footprint and associated buffers detailing the methodology and findings of the assessments, in compliance with the procedures for assessment and reporting on aquatic biodiversity as per GN320 of 20 March 2020.
Air Quality	Ambient Air Quality Impact Assessment	TiKOTECH (Pty) Ltd.	<p>The air quality impact assessments (AQIA) will entail the following steps:</p> <ul style="list-style-type: none"> • Desktop analysis, using amongst others satellite imagery. Consider the location, the airshed priority, the background air quality, the surrounding land use and existing sources and the receptors within a 10km radius of the site. • Site visit and on-site inspection.

Aspect	Specialist Study	Specialist	Terms of Reference
			<ul style="list-style-type: none"> • Draft a site sensitivity verification report in line with the site sensitivity requirements where a specialist assessment is required but no specific assessment protocol has been prescribed as set out in Government Notice (GN) Number 320, in Government Gazette (GG) 43110. • Understand of the nature and extent of the operation and the air pollutants of concern. • Further investigate the nature and extent of the environment surrounding the operation (such as topography and weather). • Develop an emission inventory. The emission inventory will be developed based on emission factors and any available emission sampling reports (where available). Where emission factors are not available, emissions will be estimated based on reasoned assumptions. The emission inventory will be limited to criteria pollutants related to the activities. • Identify appropriate regulatory requirements, standards and guidelines. • Determine the assessment level and choose an appropriate model. • Plan the study. • Set the model up for the chosen scenarios. • Run model on software for different chosen scenarios. • Simulate the dispersion of the air pollutants for the chosen scenarios. • Review any warning and informational messages within modelling output files. • Compare the simulated ground level concentrations to the national ambient air quality standards and international guidelines. • Conduct a risk assessment using the Environmental Assessment Practitioner's risk assessment methodology. • Prepare a report that follows the requirements as set out in the regulations prescribing the format of the Atmospheric Impact Report, GN R284 of 2015 under NEM: AQA and in Appendix 6 of the EIA Regulations, GN 982 of 2014 under NEMA (as amended).
Noise	Environmental Noise Impact Assessment	EnviroRoots (Pty) Ltd.	<p>The study will determine the potential noise impact on the surrounding environment due to the project. The purpose of this study will be to:</p> <ul style="list-style-type: none"> • Model noise generated by the activities through Measurements conducted at receptors (I&APs or noise sensitive developments) in terms of SANS10103:2008, National environmental Act (Act No. 107 OF 1998), GN NO. 326 and GN R154 (National Noise Control Regulation) methodology. A minimum of 10-minute day and night measurements will be conducted (day/night as per SANS10103:2008).; • Determine impact of activities; • Identify gaps and limitations; and • Establish mitigation and management measures.
Visual	Landscape/Visual Impact Assessment	Elemental Sustainability (Pty) Ltd.	<p>The scope of work for this Visual Impact Assessment will include:</p> <ul style="list-style-type: none"> • Describe the existing visual characteristics of the site and its environs; • Viewshed and viewing distance using GIS analysis up to 15 km from the structures; • Visual Exposure Analysis;

Aspect	Specialist Study	Specialist	Terms of Reference
Groundwater	Geohydrological Impact Assessment	Geo Pollution Technologies – Gauteng (Pty) Ltd.	<ul style="list-style-type: none"> • Consider, evaluate and rate the potential visual impacts; and • Propose relevant management and mitigation measures to lessen the anticipated impacts. <p>The following scope of work as per the requirements for water use license applications is foreseen:</p> <ul style="list-style-type: none"> • Hydrocensus of the area and aquifer testing of three (3) available boreholes. • Model update based on available data (water quality, levels and geochemical information). • Water quality report and impact assessment based on available data and modelling. <p>Existing data will be used to quantify the potential impact on the receiving environment. A geohydrological report will be drafted which can be submitted to regulators.</p> <p>A hydro census covering at least an area of 1 km surrounding the penceast will be done to gain water quality and water level information. This will be followed by aquifer testing using an 8 hour constant discharge test of three (3) identified boreholes.</p> <p>Predictive modelling using available data for impact prediction will be done to quantify potential impacts from mining:</p> <ul style="list-style-type: none"> • Groundwater flow, transport modelling to predict the impacts of the mining on groundwater quantity and quality in the region of the mine (Positive and negative). • A groundwater management and a monitoring network plan will be included in the report. • The report can be discussed with the client and relevant authorities. • Further drilling and aquifer tests might be required on completion of the impact predictions to quantify the impacts. <p>A report detailing the findings of the study will provided in the format of regulations regarding the procedural requirements for water use license applications and appeals, specialist groundwater study (published, March 2017). A final report can be made available 12 weeks from date of appointment.</p>
Biodiversity (Fauna and Flora) Assessment	Terrestrial Biodiversity Impact Assessment	Enviridi environmental (Pty) Ltd.	<p>The terms of reference for this impact assessment study will be as follows:</p> <ul style="list-style-type: none"> • A baseline assessment is conducted to establish whether any potentially sensitive species/receptors might occur on the study sites. • A desktop review of the conservation context of the site in relation to areas of biodiversity importance based on available conservation planning for the Province/Municipal area; • A field visit to survey habitats (concentrating on untransformed areas) in order to obtain an indication of the current status of mapped vegetation units (vegetation composition, condition of habitats, etc.); • Searching out of potential breeding zones and sensitive habitat types required for optimal biodiversity or sensitive species that might inhabit these areas;

Aspect	Specialist Study	Specialist	Terms of Reference
			<ul style="list-style-type: none"> • An assessment of the potential of habitats to support key flora and fauna species of conservation concern identified as potentially occurring on the site; • Developing a terrestrial biodiversity sensitivity map for each of the project areas based on field visits and supported by appropriate regional information to inform the impact assessment; • An assessment of potential impacts, including cumulative impacts, to terrestrial biodiversity of the project area; • Recommendation of site-specific mitigation measures; and • Compilation of a specialist terrestrial ecology assessment report for the development footprint and associated buffers detailing the methodology and findings of the assessments, in compliance with the procedures for assessment and reporting on terrestrial biodiversity. <p>The terms of reference for the Vegetation Assessment will be as follows:</p> <ul style="list-style-type: none"> • Describe the affected floristic environment from available literature and by means of a desktop study to identify a list of possible floral species that are likely to occur on site. • List and record endangered, red data and protected plant species found on site. • List exotic and invasive plant species found on site. • List plants found on site with medicinal properties • Identification of anticipated impact of the project on the vegetation and ecosystem services. • Provide proposals for mitigation of identified impacts. • Draw up a sensitivity map indicating all sensitive areas, transformed areas and buffers around sensitive features. <p>The main objectives of the fauna study will be as follows:</p> <ul style="list-style-type: none"> • To provide a description of the potentially affected fauna habitat by making use of available literature resources, and in so compiling a list of fauna species likely to occur on site; • To list and record endangered, red data or protected fauna species found or likely to occur on site; • To assess the condition of suitable habitat on site for sensitive fauna species; • To compile a sensitivity map indicating sensitive or non-sensitive or transformed areas and relevant buffer zones; • To identify anticipated impacts of the development on fauna species; and • To provide mitigation measures to limit and/or eliminate the anticipated impacts.
Soil and Land Capability	Soils and Land Capability, including Agricultural Potential	Index (Pty) Ltd.	<ul style="list-style-type: none"> • The Waterkloof opencast project area will be assessed using available desktop data. • The assessment includes:

Aspect	Specialist Study	Specialist	Terms of Reference
			<ul style="list-style-type: none"> - The site survey will be conducted by physical soil classification at a survey point every 150 m apart. The information, together with other data such as contours, will be used to classify the area into land capability classes following both the DAFF system as well as the guidelines outlined by the South African Chamber of Mines. - Six soil samples will be collected for soil analysis of basic soil fertility parameters and also to inform the soil monitoring recommendations. - The agricultural potential of the area will be determining using the baseline soil properties as well as climate data. The area will also be assessed for other agricultural production options such irrigated agriculture and livestock production. - The report will be compliant with the NEMA regulations for specialist studies as well as other legislation relevant to the fields of soil and agricultural potential. <p>For the impact assessment, a methodology recommended by Elemental Sustainability (Pty) Ltd will be used.</p>
Closure and Rehabilitation	Closure and Rehabilitation Plans including Financial Provision – GNR 1147	Elemental Sustainability (Pty) Ltd.	The financial provision for the project will be determined by Elemental Sustainability and would be determined in accordance with the NEMA Regulations (1147 of 2015) pertaining to the financial provision for mining operations.

10.3.1 SPECIALIST CONSULTANTS

Specialist consultants will be appointed to provide discipline specific input during the EIA phase and the following specialist disciplines are proposed at this stage:

Table 29: Specialist Studies to be undertaken for the Waterkloof Section 24G opencast area.

Specialist Studies		Included	Existing	Motivation
1	Soils and Land capability, including Agricultural Potential Assessment	Yes		
2	Landscape/Visual Impact Assessment	Yes		
3	Archaeological and Cultural Heritage Impact Assessment	No	X	
4	Palaeontology Impact Assessment	No		X
5	Terrestrial Biodiversity (Fauna and Flora) Impact Assessment (Plant and Animal Assessment)	Yes		
6	Hydrology Assessment and Aquatic Assessment	Yes		
7	Geohydrological Impact Assessment	Yes		
8	Noise Impact Assessment	Yes		
9	Traffic Impact Assessment	No		Not using public roads
10	Geotechnical Assessment	No		A geotechnical study will not be undertaken as activities have already occurred.
11	Air Quality Impact Assessment	Yes		
12	Blasting and Vibration Assessment	No		
13	Closure and Rehabilitation Plans (including Financial Provisioning) – GNR 1147	Yes		
14	Waste Classification	Existing study		
Engineering Work		Included	Existing	Motivation
16	Stormwater Management Plan, including Detailed Designs	No		The activities have already been undertaken
17	Residue stockpile design for overburden	No		

In line with NEMA GNR 982 (Appendix 6) as amended, the details of the relevant specialists, a summary of their expertise, as well as their declarations of independence will be included in their respective reports that will be appended to the EIA Report.

10.4 ELEMENTAL SUSTAINABILITY IMPACT ASSESSMENT METHODOLOGY

The impact assessment methodology used to determine the significance of impacts prior and after mitigation is presented below.

Extent of the impact

The EXTENT of an impact is the physical extent/area of impact or influence.

Score	Extent	Description
1	Footprint	The impacted area extends only as far as the actual footprint of the activity.
2	Site	The impact will affect the entire or substantial portion of the site/property.
3	Local	The impact could affect the area including neighbouring properties and transport routes.
4	Region	Impact could be widespread with regional implication.
5	National	Impact could have a widespread national level implication.

Duration of the impact

The DURATION of an impact is the expected period of time the impact will have an effect.

Score	Duration	Description
1	Short term	The impact is quickly reversible within a period of less than 2 years, or limited to the construction phase, or immediate upon the commencement of floods.
2	Short to medium term	The impact will have a short term lifespan (2–5 years).
3	Medium term	The impact will have a medium term lifespan (6 – 10 years)
4	Long term	The impact will have a medium term lifespan (10 – 25 years)
5	Permanent	The impact will be permanent beyond the lifespan of the development

Intensity of the impact

The INTENSITY of an impact is the expected amplitude of the impact.

Score	Intensity	Description
1	Minor	The activity will only have a minor impact on the affected environment in such a way that the natural processes or functions are not affected.
2	Low	The activity will have a low impact on the affected environment.

3	Medium	The activity will have a medium impact on the affected environment, but function and process continue, albeit in a modified way.
4	High	The activity will have a high impact on the affected environment which may be disturbed to the extent where it temporarily or permanently ceases.
5	Very High	The activity will have a very high impact on the affected environment which may be disturbed to the extent where it temporarily or permanently ceases.

Reversibility of the impact

The REVERSIBILITY of an impact is the severity of the impact on the ecosystem structure

Score	Reversibility	Description
1	Completely reversible	The impact is reversible without any mitigation measures and management measures
2	Nearly completely reversible	The impact is reversible without any significant mitigation and management measures. Some time and resources required.
3	Partly reversible	The impact is only reversible with the implantation of mitigation and management measures. Substantial time and resources required.
4	Nearly irreversible	The impact is can only marginally be reversed with the implantation of significant mitigation and management measures. Significant time and resources required to ensure impact is on a controllable level.
5	Irreversible	The impact is irreversible.

Probability of the impact

The PROBABILITY of an impact is the severity of the impact on the ecosystem structure

Score	Probability	Description
1	Improbable	The possibility of the impact occurring is highly improbable (less than 5% of impact occurring).
2	Low	The possibility of the impact occurring is very low, due either to the circumstances, design or experience (5% to 30% of impact occurring).
3	Medium	There is a possibility that the impact will occur to the extent that provision must be made therefore (30% to 60% of impact occurring).
4	High	There is a high possibility that the impact will occur to the extent that provision must be made therefore (60% to 90% of impact occurring).
5	Definite	The impact will definitely take place regardless of any prevention plans, and there can only be relied on migratory actions or contingency plans to contain the effect (90% to 100% of impact occurring).






Calculation of Impacts – Significance Rating of Impact

Significance is determined through a synthesis of the various impact characteristics and represents the combined effect of the Irreplaceability (Magnitude, Extent, Duration, and Intensity) multiplied by the Probability of the impact. The significance of an impact is rated according to the scores as presented below:

Equation 1:

$$\text{Significance} = \text{Irreplaceability (Reversibility + Intensity + Duration + Extent)} \times \text{Probability}$$

Significance Rating

Score	Significance	Colour Code
1 to 20	Very low	
21 to 40	Low	
41 to 60	Medium	
61 to 80	High	
81 to 100	Very high	

Degree to which the impact can be mitigated: *The effect of mitigation measures on the impact and its degree of effectiveness:*

Equation 2:

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

Mitigation Efficiency (ME)

High	0,2
Medium to High	0,4
Medium	0,6
Low to Medium	0,8
Low	1,0

Confidence rating: *Level of certainty of the impact occurring.*

- **Certain**
- **Sure**
- **Unsure**

Cumulative impacts: *The effect the combination of past, present and “reasonably foreseeable” future actions have on aspects.*

- Very Low cumulative impact
- Low cumulative impact

- Medium cumulative impact
- High cumulative impact

10.5 ENVIRONMENTAL IMPACT ASSESSMENT REPORT

Once a decision is provided on the FSR, the following activities conducted will proceed into detailed EIR phase if the decision issued by the DMRE on the FSR requests that the EIA reporting be conducted. WSP will produce a Draft EIAR after the completion of the required specialist studies. The Draft EIAR will provide an assessment of all the identified key issues and associated impacts from the Scoping phase. All requirements as contemplated in the EIA Regulations (GNR 982, as amended) will be included in the Draft EIAR. The Draft EIAR will contain, inter alia, the following:

- Details of the EAP who prepared the report and the expertise of the EAP to carry out the rectification process, including a curriculum vitae;
- 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 the coordinates of the boundary of the property or properties;
- A plan which locates the activity or activities applied for as well as the associated structures and infrastructure at an appropriate scale;
- A description of the scope of the activity, including all listed and specified activities triggered and being applied for; and a description of the associated structures and infrastructure related to the project;
- A description of the policy and legislative context within which the development is located and an explanation of how the development complies with and responds to the legislation and policy context;
- A motivation for the need and desirability for the development, including the need and desirability of the activity in the context of the preferred location;
- A motivation for the preferred development footprint within the approved site;
- A full description of the process followed to reach the development footprint within the approved site;
- Details of the public participation process undertaken;
- A summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them;
- The environmental attributes associated with the development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;
- The impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts;
- The methodology used in determining and ranking of potential environmental impacts and risks;
- Positive and negative impacts;
- An assessment of each identified potentially significant impact and risk;
- The possible mitigation measures that could be applied;
- An environmental impact statement;
- A description of any assumptions, uncertainties and gaps in knowledge;
- A reasoned opinion as to whether the activity should or should not be authorised;

- An undertaking under oath or affirmation by the EAP; and
- An EMPR.

10.6 STAKEHOLDER AND AUTHORITY ENGAGEMENT

10.6.1 PUBLIC PARTICIPATION PROCESS

Written notices will be provided to all registered I&APs, landowners in and around the adjacent Mining Right area and to all other registered stakeholders. Written notices will also be sent to the municipality that has jurisdiction in the area and all organs of state (refer to Section 4.5.6) as preidentified and that have registered for the project. The written notice will advise where the EIAR can be accessed for review, contact details for the relevant EAP and where I&APs can send comments/concerns.

SMSs will be sent to I&APs that have only provided a cell phone number. The SMS will advise where the report can be accessed and the contact details of the EAP.

Public open day can be schedule if required by I&APs. The purpose of public meetings during the Scoping Phase is to introduce the project and to get the potential Interested and Affected parties (I&APs) to register, as well as raise any concerns or issues that the I&APs may have with regards to the proposed Millsell-Waterkloof Opencast Mine Project.

Alternatively Zoom or Skype, and/or phone calls with landowners and other I&APs can be undertaken.

All issues raised and / or comments received will be included in the Public Participation Report, which will be updated for the EIAR to be submitted to the competent authority.

10.7 NOTIFICATION OF ENVIRONMENTAL AUTHORISATION

All stakeholders will receive a letter at the end of the process notifying them of the authority's decision and explaining the appeals procedure.

10.8 CONSULTATION WITH AUTHORITIES

It is envisaged that consultation with the DMRE will coincide with the compilation of the following key documents:

- DSR;
- FSR;
- Draft EIAR/EMPr; and
- Final EIAR/EMPR.

11 WAY FORWARD

This DSR contains:

- A description of the activities;
- A description of the alternatives considered to date;
- An outline of the process to be followed;
- Information on the proponent, EAP and stakeholders who have chosen to participate in the project;
- An outline of the environment in which the project falls;
- Information on the potential environmental impacts to be studied in more detail during the EIAR phase of the project; and
- Information on the specialist studies to be undertaken.

A number of environmental impacts have been identified as requiring some more in-depth investigation and the identification of detailed mitigation measures, namely transport and air quality. Therefore, a detailed EIA is required to be undertaken in order to provide an assessment of these potential impacts and recommend appropriate mitigation measures.

The recommendation of this report is that detailed specialist studies for terrestrial ecology and heritage are undertaken on the project areas. The scope of work required in the EIR phase of the project is included in the ToR for EIA in this DSR.

The DSR will be made available for review from **24 February 2023 to 27 March 2023**. All issues and comments submitted to Elemental will be incorporated in the CRR which will be attached as an Appendix to the FSR.

The DSR will be submitted to the delegated competent authorities responsible for authorising this project.

If you have any further enquiries, please feel free to contact:

Elemental Sustainability (Pty) Ltd

Attention: Sonja van de Giessen

Tel: 083 3884633

E-mail: sonja@elemental-s.co.za

12 UNDERTAKING BY THE EAP

I, Sonja van de Giessen, the Environmental Assessment Practitioner responsible for compiling this report, undertake that:

- the information provided herein is correct;
- the comments and inputs from stakeholders and I&APs have been correctly recorded, although due to the volume of comments and objections received from I&APs, it's possible that not all the information has been included;
- information and responses provided to stakeholders and I&APs by the EAP is correct to the best of Elemental Sustainability's knowledge at the time of compiling the report; and
- the level of agreement with I&APs and stakeholders has been correctly recorded and reported.



Signature of the EAP

Date: 21 February 2023

-END-

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LIST OF APPENDICES

- APPENDIX A : QUALIFICATIONS OF THE EAPs AND DECLARATION**
- APPENDIX B : LOCALITY MAP**
- APPENDIX C : INFRASTRUCTURE LAYOUT PLAN**
- APPENDIX D : PUBLIC PARTICIPATION PROCESS**