BASIC ASSESSMENT REPORT AND ENVIRONMENTAL MANAGEMENT PROGRAMME FOR THE COMMUNITY WASTE ROCK BENEFICIATION FACILITY, SAMANCOR MILLSELL MINE, NORTH WEST PROVINCE

DMR REF. NO: NW 30/5/1/2/3/2/1/ (236, 260 & 479) EM
ENVASS REF. NO: BAR-EMPR-REP-217-18_19

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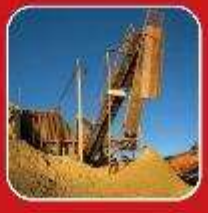

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REPUBLIC OF SOUTH AFRICA

BASIC ASSESSMENT REPORT

AND

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

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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Signature			
Date	07-11-2018	13-11-2018	13-11-2018

1. IMPORTANT NOTICE

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

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

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

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

It is furthermore an instruction that the Environmental Assessment Practitioner must process and interpret his/her research and analysis and use the findings thereof to compile the information required herein. (Unprocessed supporting information may be attached as appendices).

The EAP must ensure that the information required is placed correctly in the relevant sections of the Report, in the order, and under the provided headings as set out below, and ensure that the report is not cluttered with un-interpreted information and that it unambiguously represents the interpretation of the applicant.

2. OBJECTIVE OF THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

The objective of the environmental impact assessment process is to, through a consultative process—

(a) determine the policy and legislative context within which the activity is located and document how the proposed activity complies with and responds to the policy and legislative context;

(b) describe 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 the location of the development footprint within the preferred site based on an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects of the environment;

(d) determine the—-

  (i) nature, significance, consequence, extent, duration and probability of the impacts occurring to inform identified preferred alternatives; and

  (ii) degree to which these impacts—

    (aa) can be reversed;

    (bb) may cause irreplaceable loss of resources, and

    (cc) can be avoided, managed or mitigated;

(e) identify the most ideal location for the activity within the preferred site based on the lowest level of environmental sensitivity identified during the assessment;

(f) identify, assess, and rank the impacts the activity will impose on the preferred location through the life of the activity;

(g) identify suitable measures to manage, avoid or mitigate identified impacts; and

(h) identify residual risks that need to be managed and monitored.

EXECUTIVE SUMMARY

Environmental Assurance (Pty) Ltd (ENVASS) as independent environmental consultant was appointed by Samancor Chrome Limited to undertake the basic assessment process and waste management licence application for the development of the community waste rock beneficiation facility at the Samancor Millsell Mine.

The Millsell Mine commits itself to establishing and implementing an LED project that can assist in job creation, infrastructure development and wealth creation for the benefit of communities affected by its operations. In an effort to diversify the local economy, Millsell will assist the Ikemeleng Community Trust to establish a business that will beneficiate the Millsell waste-rock, turning it into saleable products.

The mine will invest in the crushing and screening plant, a batching plant and a loader on an area authorised for waste rock stockpiling. The project will crush stone and sort it in different sizes. Other products produced might include, but are not limited to, the following:

- Ready-mix concrete
- Pre-bagged products
- Stope support systems for the mining industry
- Precast walling
- Kerbs and edging

The products will be supplied to residential customers, as well as mining and construction companies and municipalities. The products will be introduced in phases in the course of the project.

Samancor Chrome Limited was granted a **Waste Management Licence (WML) (NW 30/5/1/2/3/2/1/ (236, 260 & 479) EM)** for the existing waste rock section.

Legislative Requirements

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

- Constitution of South Africa, 1996 (Act No. 108 of 1996) [as amended];
- National Environmental Management Act (No. 107 of 1998) [as amended];
- EIA Regulations, 2014 (Government Notices 982, 983, 984) [as amended];
- National Environmental Management: Waste Act, 2008 (Act 59 of 2008);
- Mineral and Petroleum Resources Development Act, 2002 (Act. 28 of 2002) [as amended];
- Mine Health and Safety Act, 1996 (Act No. 29 of 1996) [as amended] and associated regulations;
- 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 2014);
- Conservation of Agricultural Resources Act (Act No. 43 of 1983);
- Hazardous Substances Act, 1973 (Act 15 of 1973) [as amended];
- Hazardous Chemical Substances Regulations, 1995 (Government Notice 1179 of 1995); and
- All other relevant national, provincial, district and local municipality legislation and guidelines that may be applicable to the application. Some of these are discussed in the next section.

Need and Desirability

The main benefits of the approval of the Community Waste Rock Beneficiation Facility are listed below:

- The authorisation would ensure improved compliance of the operations;
- It contributes to the economic welfare of the surrounding community by creating working opportunities;
- It contributes to the upliftment of living standards and the health and safety of the local community;
- The project is aligned with the objectives of key government guideline documents including inter alia the Rustenburg Local Municipality and the Bojanala Platinum District Municipality Integrated Development Plans.

Additional socio-economic needs and desirabilities include:

Aspect	Comment
Creation of residential and employment opportunities	The project will create employment opportunities.
Complimenting other uses in the area	Decreasing the volume of waste rock stored by reusing waste rock.
Alignment with planning for the area	The proposed project is in alignment with the spatial objectives of the Rustenburg Local Municipality and Bojanala Platinum District Municipality. Mining creates a significant amount of jobs and the mine contributes towards this figure by creating new and sustaining existing jobs.
Use of underutilized land available (only for urban related development)	The land, authorised for the storage of waste rock, will now be utilized to create jobs and uplift the local community.
Optimization of the use of existing resources and infrastructure	The existing infrastructure on site will be used for creating jobs and uplifting the local community, instead of just being used as a waste rock stockpile area.
Encouragement of environmentally sustainable land development practices and processes	The road development will sterilise a portion of cultivated land. However, it will not be a significant portion. In terms of land use management, the road development is in alignment with required practices.
Consideration of special locational factors that might favor the specific location	The current area has been previously disturbed by mining activities and no sensitive environmental receptors will be impacted upon as a result of the proposed development.

Aspect	Comment
Generation of the highest socio-economic returns	The development of the waste rock beneficiation facility will increase socio-economic returns, whereas not developing the facility will not create jobs, increase income or train people from the local community.
Impact on the sense of history, sense of place and heritage of the area and the socio-cultural and cultural-historic characteristics and sensitivities of the area	The proposed development does not impact on the sense of history and culture of the place as the location earmarked for the development is currently being used for mining activities and already distrurbed.

There is no feasible alternative location for the proposed development as the area has already been authorised for listed waste activities (storage of waste rock) and as a result the natural environmental state has been altered.

The mine will invest in the crushing and screening plant, a batching plant and a loader. The project will crush stone and sort it in different sizes. Other products produced might include, but are not limited to, the following:

- Ready-mix concrete
- Pre-bagged products
- Stope support systems for the mining industry
- Precast walling
- Kerbs and edging

The products will be supplied to residential customers, as well as mining and construction companies and municipalities. The products will be introduced in phases during the course of the project.

Alternatives

The following alternatives were investigated as feasible alternatives:

- Design alternatives;
- Recycling (Technology alternatives); and
- Not authorising the community waste rock beneficiation facility (No – Go alternative).

Public Participation

A Public Participation Process is undertaken for the proposed waste management facilities. The process is undertaken to ensure compliance with regard to the requirements in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) [as amended] (MPRDA), the National Environmental Management Act, 1998 (Act No. 107 of 1998) [as amended] (NEMA), the National Environmental Management: Waste Act, 2008 (Act No 59 of 2008) [as amended] (NEMWA) as well as the Environmental Impact Assessment Regulations (2014) (as amended in 2017).

Tasks undertaken for the Public Participation Process (PPP):

- Identification of key interested and affected parties (affected and adjacent landowners) and other stakeholders (organs of state and other parties);
- Formal notification of the application to interested and affected parties (including all affected and adjacent landowners) and other stakeholders; and
- Consultation and correspondence with I&APs and stakeholders.

Specialist studies

Specialist studies used for the application of the WML NW 30/5/1/2/3/2/1/ (236, 260 & 479) EM for the same property during 2015/2016 were utilized for the environmental impact assessment and environmental management programme:

- Archeological Impact Assessment (AIA);
- Ecological Scan (EcSc);
- Visual Impact Assessment (VIA);
- Air Quality Baseline Assessment (AIBA); and
- Noise Baseline Assessment (NBA).

Reasoned Opinion of the EAP

This EIA and EMPr focused only on the development of the Community Waste Rock Beneficiation Facility on Portion 410 of the Farm Waterkloof 305 JQ. Based on the findings of the environmental impact assessment, the EAP is of the opinion that the proposed development be approved, due to the positive social and economic impacts for the local Ikemeleng community. The potential negative impacts can be mitigated to acceptable levels, provided that the mitigation measures are strictly implemented and monitored.

In general, it is recognised that the proposed development has the potential to pose various risks to the environment as well as to the residents or businesses in the surrounding area. However, based on the findings of this EIA documented in this report, all impacts can be mitigated to acceptable levels. Furthermore, the proposed activities will be located on previously disturbed land.

This report shows that the proposed development has the potential to provide many socio-economic benefits to the local and regional communities. The EAP therefore recommends that the proposed activities be approved on condition that the EMPR is strictly implemented and monitored for compliance. Should the activities not be approved, the Samancor Chrome Limited Millsell Mine will not be utilised to its full economic potential, losing the ability of the mine to provide socio-economic benefits to the local community and the country as a whole.

Recommendations

It is recommended by the EAP that the following conditions be included in the authorisation:

- The EMPR is a contractual document and must be implemented at the Millsell Mine at all times;
- An independent environmental control officer (ECO) must be appointed to monitor the implementation of the EMPR and audit reports kept by the applicant;
- All contractors and employees of Millsell, must be made aware of the EMPR and its requirements as well as the impact of not implementing the measures of the EMPR;
- Copies of the EMPR, Environmental Authorisation, Mining Right and Waste Management License, and any emergency procedures and method statements, must be kept on site and be available on request of the Competent Authority.

Conclusion

A variety of mitigation and management measures have been identified that will serve to mitigate the scale, intensity, duration or significance of the potential negative impacts identified. These include guidelines to be applied during the construction, operational and closure phases of the proposed project. The Environmental Management Programme (EMPR) contains detailed mitigation measures. The proposed mitigation measures, if implemented, will reduce the significance of the majority of the identified impacts.

Framework of the report

The report is based on the template provided by the Department of Mineral Resources for Environmental Impact Assessment (EIA) Reports and Environmental Management Programmes (EMPRs). The report includes all the Requirements for EIAs / EMPRs listed in Appendix 3 and 4 of the EIA Regulations, 2014, Government Notice Regulation (GNR) 982 [as amended], promulgated in terms of the National Environmental Management Act, 1998 (Act No. 1998) [as amended] (NEMA).

Table 1: Framework of the EIA/EMPR

GNR 982 Appendix 3	Section
(a) details of- (i) the EAP who prepared the report; and (ii) the expertise of the EAP, including a curriculum vitae.	PART A: SECTION 1 (a) (i) and (ii)
(b) the location of the activity, including: (i) the 21-digit Surveyor General code of each cadastral land parcel; (ii) where available, the physical address and farm name; and (iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties.	PART A: SECTION 1 (b) (i), (ii) and (iii)
(c) a plan which locates the proposed activity or activities applied for as well as the associated structures and infrastructure at an appropriate scale, or, if it is- (i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; (ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken.	PART A: SECTION 1 (c) (i) and (ii)
(d) a description of the scope of the proposed activity, including- (i) all listed and specified activities triggered and being applied for; and (ii) a description of the associated structures and infrastructure related to the development.	PART A: SECTION 1 (d) (i) and (ii)
(e) a description of the policy and legislative context within which the development is located and an explanation of how the proposed development complies with and responds to the legislation and policy context.	PART A: SECTION 1 (e)
(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.	PART A: SECTION 1 (f)
(g) a motivation for the preferred development footprint within the approved site.	PART A: SECTION 1 (g)

GNR 982 Appendix 3	Section
(h) a full description of the process followed to reach the proposed development footprint within the approved site, including: (i) details of the development footprint alternatives considered; (ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs; (iii) 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; (iv) the environmental attributes associated with the development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; (v) the impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts- (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated; (vi) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks; vii) 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; (viii) the possible mitigation measures that could be applied and level of residual risk; (ix) if no alternative development locations for the activity were investigated, the motivation for not considering such; and (x) a concluding statement indicating the preferred alternative development location within the approved site.	PART A: SECTION 1 (h)
(I) a full description of the process undertaken to identify, assess and rank the impacts the activity and associated structures and infrastructure will impose on the preferred location through the life of the activity, including- (i) a description of all environmental issues and risks that were identified during the environmental impact assessment process; and (ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures.	PART A: SECTION 1 (I) (i), (ii)
(j) an assessment of each identified potentially significant impact and risk, including- (i) cumulative impacts; (ii) the nature, significance and consequences of the impact and risk; (iii) the extent and duration of the impact and risk; (iv) the probability of the impact and risk occurring; (v) the degree to which the impact and risk can be reversed;	PART A: SECTION 1 (j) (i) – (vii)

GNR 982 Appendix 3	Section
(vi) the degree to which the impact and risk may cause irreplaceable loss of resources; and (vii) the degree to which the impact and risk can be mitigated.	
(k) where applicable, a summary of the findings and recommendations of any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final assessment report.	PART A: SECTION 1 (k)
(l) an environmental impact statement which contains- (i) a summary of the key findings of the environmental impact assessment: (ii) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers; and (iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives.	PART A: SECTION 1 (l) (i), (ii) and (iii)
(m) based on the assessment, and where applicable, recommendations from specialist reports, the recording of proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation.	PART A: SECTION 1 (m)
(n) the final proposed alternatives which respond to the impact management measures, avoidance, and mitigation measures identified through the assessment.	PART A: SECTION 1 (n)
(o) any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation.	PART A: SECTION 1 (o)
(p) a description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed.	PART A: SECTION 1 (p)
(q) a reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation.	PART A: SECTION 1 (q)
(r) where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required and the date on which the activity will be concluded and the post construction monitoring requirements finalised.	PART A: SECTION 1 (r)
(s) an undertaking under oath or affirmation by the EAP in relation to: (i) the correctness of the information provided in the reports; (ii) the inclusion of comments and inputs from stakeholders and I&APs; (iii) the inclusion of inputs and recommendations from the specialist reports where relevant; and (iv) 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.	PART A: SECTION 1 (s) (i) - (iv)
(t) where applicable, details of any financial provisions for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts.	PART A: SECTION 1 (t)

GNR 982 Appendix 3	Section
(u) an indication of any deviation from the approved scoping report, including the plan of study, including- (i) any deviation from the methodology used in determining the significance of potential environmental impacts and risks; and (ii) a motivation for the deviation.	PART A: SECTION 1 (u) (i) and (ii)
(v) any specific information that may be required by the competent authority.	PART A: SECTION 1 (v)
(w) any other matters required in terms of section 24(4)(a) and (b) of the Act.	PART A: SECTION 1 (w)
(a) details of (i) the EAP who prepared the EMPr; and (ii) the expertise of that EAP to prepare an EMPr, including a curriculum vitae.	PART B: SECTION 1 (b) (i) and (ii)
(b) a detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description.	PART B: SECTION 1 (b)
(c) a map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that any areas that should be avoided, including buffers.	PART B: SECTION 1 (c)
(d) a description of the impact management objectives, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including- (i) planning and design; (ii) pre-construction activities; (iii) construction activities; (iv) rehabilitation of the environment after construction and where applicable post closure; and (v) where relevant, operation activities.	PART B: SECTION 1 (d) (i) - (v)
(e) a description and identification of impact management outcomes required for the aspects contemplated in paragraph (d).	PART B: SECTION 1 (e)
(f) a description of proposed impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraphs (d) and (e) will be achieved, and must, where applicable, include actions to – (a) avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation; (i) comply with any prescribed environmental management standards or practices; (ii) comply with any applicable provisions of the Act regarding closure, where applicable; and (iii) comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable.	PART B: SECTION 1 (f) (a) (i), (ii) and (iii)

GNR 982 Appendix 3	Section
(g) the method of monitoring the implementation of the impact management actions contemplated in paragraph (f).	PART B: SECTION 1 (g)
(h) the frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f); management actions.	PART B: SECTION 1 (h)
(i) an indication of the persons who will be responsible for the implementation of the impact.	PART B: SECTION 1 (i)
(j) the time periods within which the impact management actions contemplated in paragraph (f) must be implemented.	PART B: SECTION 1 (j)
(k) the mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f).	PART B: SECTION 1 (k)
(l) a program for reporting on compliance, taking into account the requirements as prescribed by the Regulations.	PART B: SECTION 1 (l)
(m) an environmental awareness plan describing the manner in which- (i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and (ii) risks must be dealt with in order to avoid pollution or the degradation of the environment.	PART B: SECTION 1 (m) (i) and (ii)
(n) any specific information that may be required by the competent authority.	PART B: SECTION 1 (n)

TABLE OF CONTENTS

TABLE OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

LIST OF ABBREVIATIONS

AIA	Archaeological Impact Assessment
AQBA	Air Quality Baseline Assessment
BIC	Bushveld Igneous Complex
BPDM	Bojanala Platinum District Municipality
BPG	Best Practice Guidelines
COM	Chamber of Mines
CSIR	Council of Scientific and Industrial Research
DEA	Department of Environmental Affairs
DMR	Department of Minerals and Resources
DO	Dissolved Oxygen
DWS	Department of Water and Sanitation
EAP	Environmental Assessment Practitioner
EcSc	Ecological Scan
EC	Electrical Conductivity
EIA	Environmental Impact Assessment
EMPR	Environmental Management Programme
ENVASS	Environmental Assurance (Pty) Ltd
GN 704	Government Notice No. 704 of 4 June 1999
GN	Government Notice
GIS	Global Information System
GPS	Global Positioning System
Ha	Hectares
I&APs	Interested and Affected Parties
IDP	Integrated Development Plan
IWUL	Integrated Water Use Licence
IWULA	Integrated Water Use Licence Application
IWWMP	Integrated Water and Waste Management Plan
LED	Local Economic Development
LM	Local Municipality
LOM	Life of Mine
MAP	Mean Annual Precipitation
MAR	Mean Annual Runoff
MPRDA	Mineral Petroleum Resources Development Act (No. 28 of 2002) [as amended]
NBA	Noise Baseline Assessment
NDP	National Development Plan

NEMA	National Environmental Management Act (No. 107 of 1998) [as amended]
NEMWA	National Environmental Management: Waste Act (No. 59 of 2008) [as amended]
NFEPA	National Freshwater ecosystem Priority Areas
NHRA	National Heritage Resource Act (No. 25 of 1999)
NWA	National Water Act (No. 36 of 1998)
PCD	Pollution Control Dam
PGM	Platinum Group Metals
PESC	Present Ecological Status Class
PPP	Public Participation Process
RLM	Rustenburg Local Municipality
RLS	Rustenburg Layered Suite
ROM	Run of Mine
SAIAB	South African Institute for Aquatic Biodiversity
SANBI	South African National Biodiversity Institute
SANParks	South African National Parks
SANS	South African National Standard
SASS5	South African Scoring System
SDF	Spatial Development Framework
SLP	Social and Labour Plan
TDS	Total Dissolved Solids
TMM	Trackless Mobile Machine
TSF	Tailings Storage Facility
USCS	Unified Soil Classification System
VAC	Visual Absorption Capacity
VIA	Visual Impact Assessment
WCM	Western Chrome Mines
WMA	Water Management Area
WML	Waste Management Licence
WQM	Water Quality Management
WRC	Water Research Commission
WRD	Waste Rock Dump
WULA	Water Use License Application
WUL	Water Use License

GLOSSARY OF TERMS

Activity: An activity is any development or expansion which requires an environmental authorisation in terms of GN 326 as contemplated in GN 324, 325, 327.

Applicant / Developer: Any person who applies for an authorisation to undertake an activity or undertake an Environmental Process in terms of the Environmental Impact Assessment Regulations – National Environmental Management Act, 1998 (Act No. 107 of 1998) as amended (NEMA) as contemplated in the scheduled activities listed in Government Notice (GN) No R. 324, 325, 327.

Archaeological resources: This includes:

- Material remains resulting from human activity which are in a state of disuse and are in or on land and which are older than 100 years including artefacts, human and hominid remains and artificial features and structures;
- Rock art, being any form of painting, engraving or other graphic representation on a fixed rock surface or loose rock or stone, which was executed by human agency and which is older than 100 years, including any area within 10m of such representation;
- Wrecks, being any vessel or aircraft, or any part thereof which was wrecked in South Africa, whether on land, in the internal waters, the territorial waters or in the maritime culture zone of the republic as defined in the Maritimes Zones Act, and any cargo, debris or artefacts found or associated therewith, which is older than 60 years or which the South African Heritage Resources Agency (SAHRA) considers to be worthy of conservation; features, structures and artefacts associated with military history which are older than 75 years and the site on which they are found.

Aspect: An element of an organisation's activities, products, or services that can interact with the environment. The element may cause a significant environmental impact, either beneficial or harmful. For example: Refrigerant use, wash water discharge, it could involve a discharge, an emission, or consumption or reuse of a material.

Biodiversity: The variety of life in an area, including the number of different species, the genetic wealth within each species, and the natural areas where they are found.

Catchment: The area from which any rainfall will drain into the watercourse or watercourses or part of the water course, through surface flow to a common point or common points.

Clean water: Clean water is any water that has not been in contact with carbonaceous material or other potential contaminants and includes run-off from areas unaffected by mining activities, as well as areas that have been rehabilitated.

Construction activities: Activities associated with physical disturbance to the land, including the storage, machinery, equipment and materials.

Construction phase: The construction phase is the period of commencement of physical disturbance to the land, excluding rehabilitation activities, such as re-vegetation and replacing of topsoil.

Container: Disposable or re-usable vessel in which waste is placed for the purposes of storing, accumulating, handling, transporting, treating or disposing of that waste and include bins, bin liners and skips.

Contaminated water: Means any water contamination by the Contractor or Applicant's activities, e.g. run-off from plant or personnel wash areas.

Contractor: Persons/organisations contracted by the Applicant to provide a service. The Contractor shall ensure compliance with this EMPR and shall request advice from the Environmental Assessment Practitioner where considered necessary and appropriate.

Corrective (remedial) action: Response required to addressing an environmental problem that is in conflict with the requirements of the EMPR. The need for corrective action may be determined through monitoring, audits or management review.

Degradation: The lowering of the quality of the environment through human activities, e.g. river degradation, soil degradation.

Dirty water: Dirty water is any water that has been in contact with carbonaceous material or other contaminants (i.e. water containing waste), and of which the water quality has been affected and therefore has the potential to cause pollution of a water resource.

Disposal: The burial, deposit, discharge, abandoning, dumping, placing or release of waste into or onto any land.

Domestic waste: Waste (excluding hazardous waste) that emanates from premises that are used wholly or mainly for residential, educational, health care, sport or recreation purposes (including garden and park wastes as well as municipal and food waste.

Ecology: The study of the interrelationships between organisms and their environments.

Emergency: An unexpected sudden occurrence, including a major emission, fire or explosion leading to serious danger to the public or potentially serious pollution of or detriment to the environment, whether immediate or delayed.

Environment: The surroundings within which humans live and that consist of:

(i) The land, water and atmosphere of the earth;

(ii) Micro-organisms, plant and animal life;

(iii) Any part or combination of (i) and (ii) and the interrelationships among and between them; and the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.

General waste: Waste that does not pose an immediate threat or hazard to health or to the environment, and includes:

(a) Domestic waste;
(b) Building and demolition waste;
(c) Business waste;
(d) Inert waste; and
(e) Any waste classified as non-hazardous waste in terms of the regulations made under section 69.

Groundwater: Water that occurs in the voids of saturated rock and soil material beneath the ground surface is referred to as groundwater and the body within which the groundwater is found is referred to as an aquifer.

Hazardous waste: Waste that contains organic or inorganic elements or compound that may, owing to the inherent physical, chemical or toxicological characteristics of that waste, have a detrimental impact on health and the environmental and includes hazardous substances, materials or object within business waste, residue deposits and residue stockpiles.

Holder of waste: Any person who imports, generates, stores, accumulates, transports, processes, treats or exports waste or dispose of waste.

Hydrogeological: The study of distribution and movement of groundwater.

Hydrological: The study of movement, distribution and quality of surface water and groundwater.

Impact: Any change to the environment, whether adverse or beneficial, wholly or partly resulting from an organization's activities, products, or services. For example: Ozone depletion, surface water quality degradation, impacts might include contamination of air or water, depletion of a natural resource or harm to human health.

Inert waste: waste that:

Does not undergo significant physical, chemical or biological transformation after disposal;

Does not burn, react physically or chemically, biodegrade or otherwise adversely affect any other matter or environment with which it may come into contact; and

Does not impact negatively on the environment because of its pollutant content and because the toxicity of its leachate is insignificant and which include discarded concrete, bricks, tiles and ceramics; discarded glass as well as discarded soil, stones and dredging spoil.

Infrastructure: The network of facilities and services that are needed for economic activities, e.g. roads, electricity, water, sewerage.

Integrated: Mixing or combining all useful information and factors into a joint or unified whole. See Integrated Environmental Management.

Integrated Environmental Management (IEM): A way of managing the environment by including environmental factors in all stages of development. This includes thinking about physical, social, cultural and economic factors and consulting with all the people affected by the proposed developments.

Interested and/or Affected Parties: Those individuals or organisations that have an interest in the proposed development or will be directly affected by the activities of the development, as identified in the Environmental Impact Assessment (EIA) process.

Mitigation measures: Measures designed to avoid, reduce or remedy adverse impacts.

Monitoring program: A program for taking regular measurements of the quantity and/or quality of a water resource, waste, wastewater discharge, or dust at specified intervals and at specific locations to determine the chemical, physical and biological nature of the water resource, waste or wastewater discharge.

Pollutant: A contaminant at a concentration high enough to endanger the environment or the public health.

Pollution:

- National Water Act, 36 of 1998: "Water pollution means the direct or indirect alteration of the physical, chemi-cal or biological properties of a water resource so as to make it –

(a) less fit for any beneficial purpose for which it may reasonably be expected to be used; or
(b) harmful or potentially harmful –
(aa) to the welfare, health or safety of human beings;
(bb) to any aquatic or non-aquatic organisms;
(cc) to the resource quality; or
(dd) to property".

- National Environmental Management Act, No. 107 of 1998:- "pollution means any change in the environment caused by –

(i) substances;
(ii) radioactive or other waves; or
(iii) noise, odours, dust or heat emitted from any activity, including the storage or treatment of waste or substances, construction and the provision of services, whether engaged in by any person or an organ of state, where that change has an adverse effect on human health or well-being or on the composition, resilience and productivity of natural or managed ecosystems, or on materials useful to people, or will have such an effect in the future."

Protection: in relation to a water resource, means –

1 (1) (xvii) (a): maintenance of the quality of the water resource to the extent that the water resource may be used in an ecologically sustainable way;

1 (1) (xvii) (b): prevention of the degradation of the water resource; and

1 (1) (xvii) (c): the rehabilitation of the water resource;

Public Participation Process: A process of involving the public in order to identify issues and concerns, and obtain feedback on options and impacts associated with a proposed project, program or development. Public Participation Process in terms of NEMA refers to: a process in which potential interested and affected parties are given an opportunity to comment on, or raise issues relevant to specific matters.

Recycle: A process where waste is reclaimed for further use, this process involves the separation of waste from a waste stream for further use and the processing of that separated materials as a product or raw material.

Rehabilitation: Rehabilitation is defined as the return of a disturbed area to a state which approximates the state (wherever possible) in which it was before disruption.

Reserve: the quantity and quality of water required:

(a) To satisfy basic human needs by securing a basic water supply, as prescribed under the Water Services Act, 1997 (Act No. 108 of 1997), for people who are now or who will, in the reasonably near future, be -

  (i) Relying upon;
  (ii) Taking water from; or
  (iii) Being supplied from, the relevant water resource; and

(b) To protect aquatic ecosystems in order to secure ecologically sustainable development and use of the relevant water resource.

Re-use: To utilise articles from the waste stream again for a similar or different purpose without changing the form or properties of the articles.

Runoff: Surface runoff is water that finds its way into a surface water body without infiltration into the soil and may include overland flow, return flow, interflow and base flow.

SANS 10234: Latest edition of the South African National Standard Globally harmonised System of the Classification and Labelling of Chemicals (GHS).

Significant Impact: The activity that results in substantial breach of statutory regulations under abnormal conditions.

Surface water: All water naturally open to the atmosphere (rivers, lakes, reservoirs, streams, impoundments, seas, estuaries, etc.); also refers to springs, wells, or other collectors that are directly influenced by surface water.

Storage: The accumulation of waste in a manner that does not constitute a treatment or disposal of that waste.

Storm water: Water that accumulates on land as a result of precipitation events, and includes runoff from areas such as roads and roofs.

Waste:

(a) any substance, material or object, that is unwanted, rejected, abandoned, discarded or disposed of, or that is intended or required to be discarded or disposed of, by the holder of that substance, material or object, whether or not such substance, material or object can be re-used, recycled or recovered and includes all wastes as defined in Schedule 3 of NEMWA [as amended]; or

(b) any other substance, material or object that is not included in Schedule 3 of NEM:WA [as amended] that may be defined as a waste by the Minister by notice in the Gazette, but any waste or portion of waste, referred to in paragraphs (a) and (b), ceases to be a waste-

i) once an application for its re-use, recycling or recovery has been approved or, after such approval, once it is, or has been re-used, recycled or recovered;
ii) where approval is not required, once a waste is, or has been re-used, recycled or recovered;
iii) where the Minister has, in terms of section 74, exempted any waste or a portion of waste generated by a particular process from the definition of waste; or
iv) where the Minister has, in the prescribed manner, excluded any waste stream or a portion of a waste stream from the definition of waste.

Waste generator: Any person whose actions, production processes or activities including waste management activities, results in the generation of waste.

Waste management: Classifying, recycling, treatment and disposal of waste generated during operational activities.

Watercourse is:

a) A river or spring;
b) A natural channel in which water flows regularly or intermittently;
c) A wetland, lake or dam into which, or from which, water flows; and
d) Any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse, and a reference to a watercourse includes, where relevant, its bed and banks.

Water quality: the physical, chemical, toxicological, biological (including microbiological) and aesthetic properties of water that determine sustained (1) healthy functioning of aquatic ecosystems and (2) fitness for use (e.g. domestic, recreational, agricultural, and industrial). Water quality is therefore reflected in (a) concentrations or loads of substances (either dissolved or suspended) or micro-organisms, (b) physicochemical attributes (e.g. temperature) and (c) certain biological responses to those concentrations, loads or physicochemical attributes.

Water resource: A water resource includes any watercourse, surface water, estuary or aquifer. Watercourses include rivers, springs, and natural perennial and non-perennial channels. Wetlands, lakes, dams, or any collection identified as such by the Minister in the Government Gazette.

Water Use Licence: An authorisation from the Department to a designated water user to use water. The authorisation will provide details on the time-frames and conditions for the designated water use.

PART A

SCOPE OF ASSESSMENT AND ENVIRONMENTAL IMPACT ASSESSMENT REPORT

Contact Person and correspondence address

a) Details of:

i) The EAP who prepared the report

Name of The Practitioner: Corrie Retief

Tel No.: 012 460 9768
Fax No.: 012 460 3071
e-mail address: corrie@envass.co.za

ii) Expertise of the EAP

(1) **The qualifications of the EAP**

*(With evidence attached as **Appendix 1**)*

- University of South Africa, BA Hons Geography - 2007
- University of South Africa, BA Environmental – 2005
- Registered with SACNASP as Pri.Sci.Nat – 2016

(2) **Summary of the EAP's past experience**.

*(Attach the EAP's curriculum vitae as **Appendix 1**)*

Corrie Retief is an Environmental Scientist with more than 11 years of experience in applying the principles of Integrated Environmental Management, and in applying the Environmental Legislation to a number of development projects and initiatives in Southern Africa. He has co-ordinated and managed number of diverse projects and programs related to the Environment and Waste within both the public and private sectors and for national, multi-national and international companies. His interpersonal and organisational skills have enabled him to efficiently direct these projects from initiation to implementation. Furthermore his training in sustainability and sustainable project delivery has helped him to deliver profitable sustainability into customers operations throughout the asset lifecycle.

A significant element of public participation is required throughout the life cycle of an EIA process. Corrie has successfully liaised with interested and affected parties, ensuring that all communication procedures and dialogues are open and transparent, and that capacity building is conducted where necessary. His proficient report-writing

skills have been utilised for the compilation of a wide variety of reports, which include but is not limited to Basic Assessment Reports, Scoping and Environmental Impact Assessment Reports, Environmental Management Plans (Planning, Construction, Operation and Closure), Environmental Audit Reports, Opportunities and Constraints Analyses, Feasibility studies, Waste License Applications, Water-Use Application Reports and Mining Right Applications.

The EAP have experience in the following disciplines:

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

b) Location of the overall Activity

Table 1: Description of the property

Farm Name:	Waterkloof 305 JQ
Application area (Ha)	24 841 m^2
Magisterial district:	Bojanala Platinum District Municipality
Distance and direction from nearest town	Rustenburg Platinum District Municipality
21-digit Surveyor General Code for each farm portion	Portion 410: T0JQ00000000030500410

c) Locality map

Attach a locality map at a scale not smaller than 1:250000 showing the nearest town and attach as ***Appendix 2***

The proposed activity will be located on Portion 410 of the Farm Waterkloof 305 JQ, North West Province, and within the jurisdiction of the Bojanala Platinum and the Rustenburg Local Municipalities. The Proposed site is located approximately 5 km south-east of the town of Rustenburg.

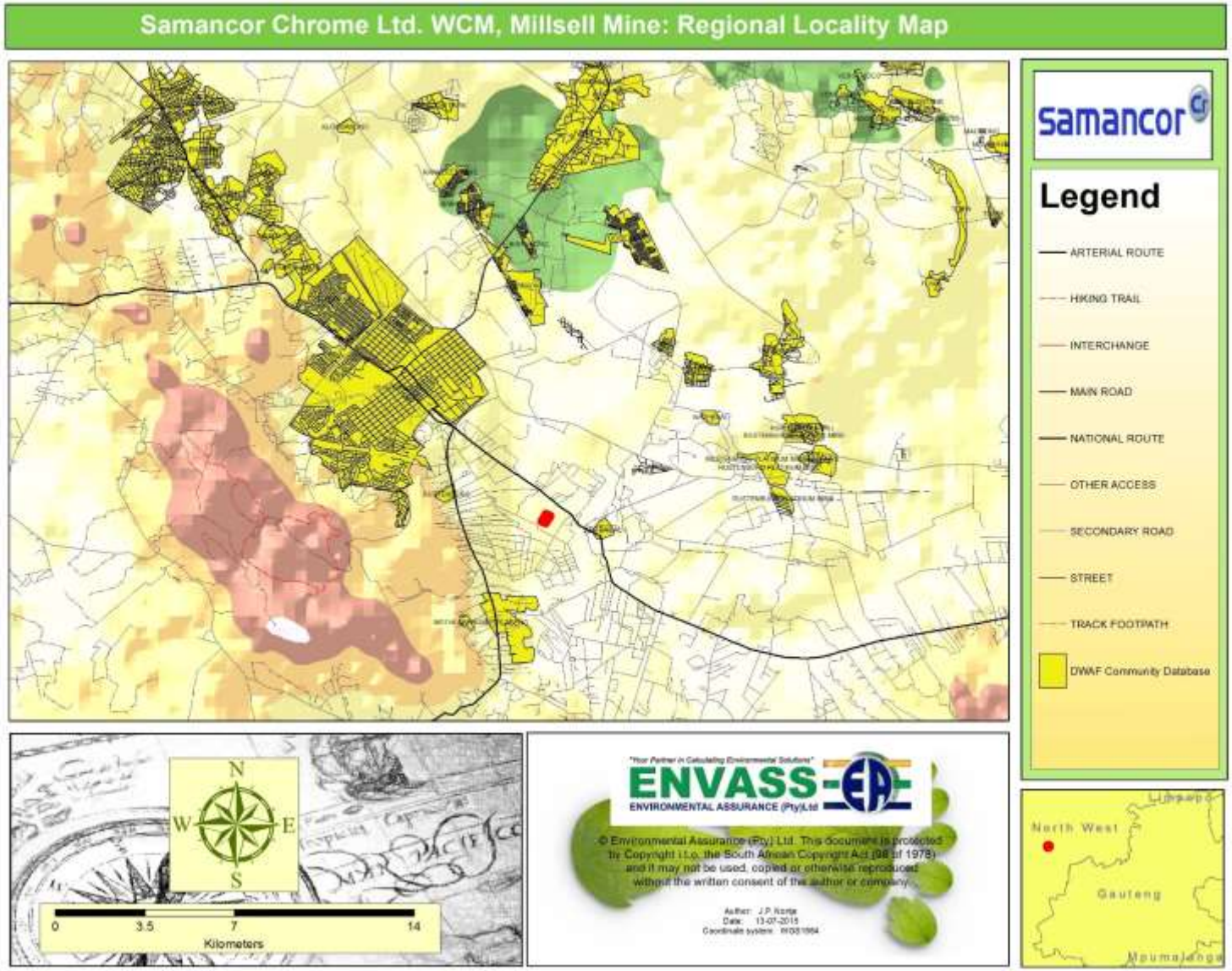


Figure 1: Regional Setting of the proposed Community Waste Rock Beneficiation Facility

d) Description of the scope of the proposed overall activity

Attach a plan drawn to a scale acceptable to the competent authority but not less than 1: 10 000 that shows the location, and area (hectares) of all the aforesaid main and listed activities, and infrastructure to be placed on site

Samancor Western Chrome Mines (WCM) is an existing complex of underground chrome mines owned by Samancor Chrome Limited. WCM is located near Mooinooi and Rustenburg, between 100 and 150 km west of Pretoria, on the western limb of the Bushveld Igneous Complex in the North-West Province. WCM are currently operating five mines i.e. Millsell/Waterkloof, Mooinooi, Buffelsfontein-East, Buffelsfontein-West and Elandsdrift (currently in care and maintenance) Mines and two tailings retreatment plants operated by a contractor, Sylvania Minerals. The total combined ore reserves of WCM exceeds 45 million tons, calculated to a depth of 600m, with an annual production capacity of more than 1.3 Mt, allowing a Life of Mine (LOM) of more than 20 years, providing employment for more than 3000 people. Current mining activities are to a depth of 900 m with a rate of 75 000 tons/month and the LOM is expected to exceed the year 2044 (Erasmus, 2014).

The Millsell Mine commits itself to establishing and implementing an LED project that can assist in job creation, infrastructure development and wealth creation for the benefit of communities affected by its operations. In an effort to diversify the local economy, Millsell will assist the Ikemeleng Community Trust to establish a business that will beneficiate the Millsell waste-rock, turning it into saleable products.

The mine will invest in the crushing and screening plant, a batching plant and a loader. The project will crush stone and sort it in different sizes. Other products produced might include, but are not limited to, the following:

- Ready-mix concrete
- Pre-bagged products
- Stope support systems for the mining industry
- Precast walling
- Kerbs and edging

The products will be supplied to residential customers, as well as mining and construction companies and municipalities. The products will be introduced in phases in the course of the project.

(i) Listed and specified activities

Table 2: Listed and specified activities:

NAME OF ACTIVITY	AERIAL EXTENT OF THE ACTIVITY (HA OR M²)	LISTED ACTIVITY	APPLICABLE LISTING NOTICE
Construction and operation of a crushing and screening plant, batching plant and a loader for the crushing of stone in different sizes to produce ready mix concrete, pre-bagged products, stope support systems for the mining industry, precast walling, kerbs and edging.	24 841 m^2	Not listed	**NEMWA (GNR. 633)** **Category A: Activity 15** The establishment or reclamation of a residue stockpile or residue deposit resulting from activities which require a prospecting right or mining permit, in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002). **NEMWA (GNR. 921)** **Category A: Activity 2** The sorting, shredding, grinding, crushing, screening or bailing of general waste at a facility that has an operational area in excess of 1000m^2.

ii) Description of the activities to be undertaken

(Describe Methodology or technology to be employed, including the type of commodity to be prospected/mined and for a linear activity, a description of the route of the activity).

The mine will invest in the crushing and screening plant, a batching plant and a loader. The project will crush stone and sort it in different sizes. Other products produced might include, but are not limited to, the following:

- Ready-mix concrete
- Pre-bagged products
- Stope support systems for the mining industry
- Precast walling
- Kerbs and edging

The products will be supplied to residential customers, as well as mining and construction companies and municipalities. The products will be introduced in phases in the course of the project.

Sustainability: Millsell Mine has been producing chrome for the largest part of 30 years. The latest life-of-mine figure is 10 years (to be confirmed and most probably underestimated). This gives a total production life of approximately 40 years.

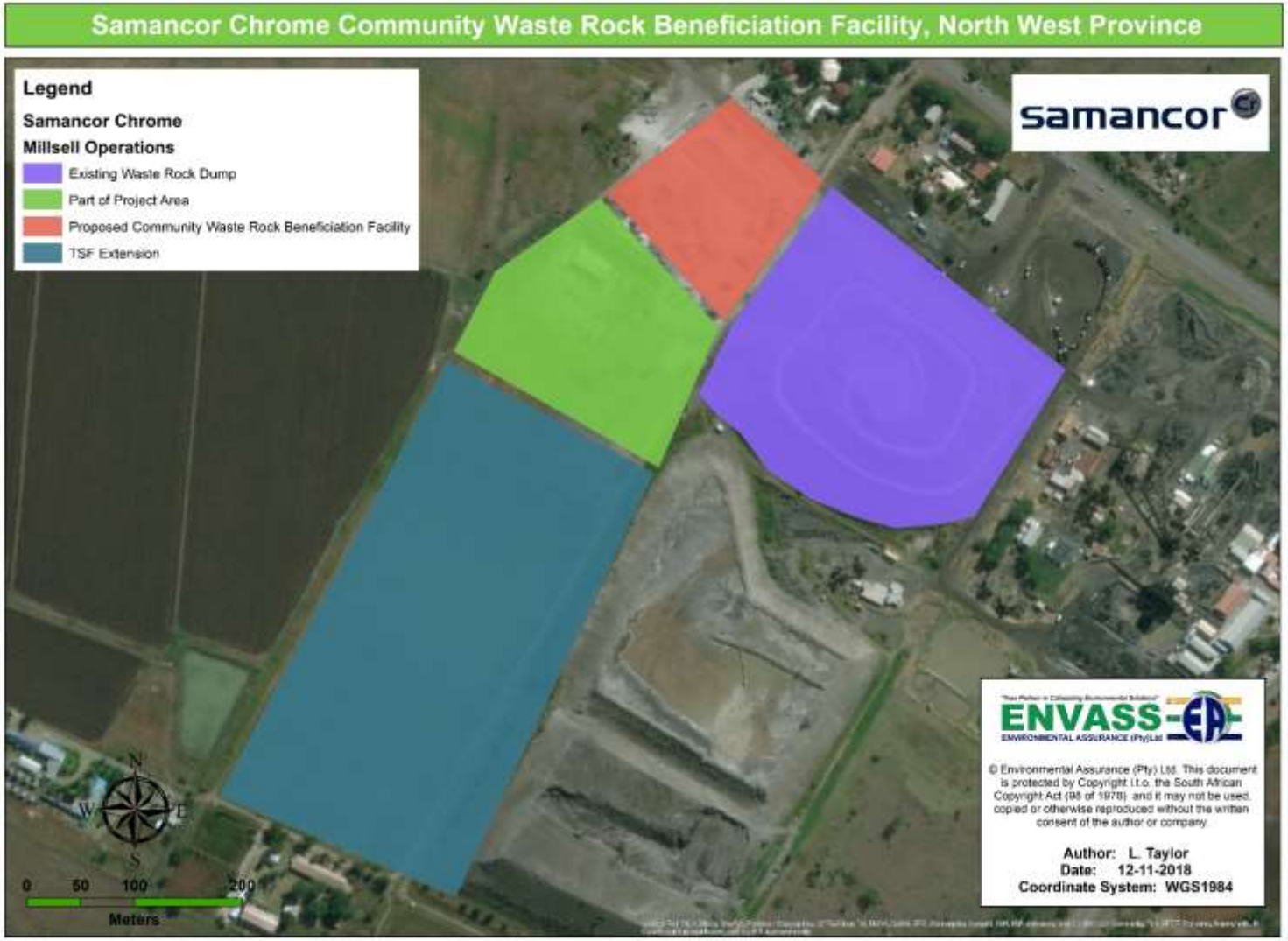


Figure 2: Millsell current and proposed infrastructure (Google Inc., 2018)

Table 3: Millsell Existing Authorisations

Mine Section and activities	Mineral and Petroleum Resources Development Act, 2002 (Act No 28 of 2002)	Date Application Approved / Submitted	Reference number/s
Approval of EMPr for a conversion of old order right to a new right in terms of Schedule II Item 7 of the MPRDA in respect of various portions of the Farm Waterkloof 305 JQ, and various Portions of the farm Waterval 306 JQ	Environmental Authorisation – Approved EMPR.	2014	NW 30/5/1/2/3/2/1/236 MR, 260 MR & 479 MR
Mine Section and activities	**National Environmental Management Act, 1998 Act No. 107 of 1998) Listing Notice (GNR 983)**	**Date Application Approved / Submitted**	**Reference number/s**
Addendum to the Environmental Authorisation in terms of Regulation 27(2)(a) as reads together with Regulation 33(1) of the Environmental Impact Assessment Regulations, 2014 for the expansion of the underground mining activities onto Portion 355 and Portion 356 of the Farm Waterkloof 305 JQ.	Listing Notice 1: Activity 34	2017	NW 30/5/1/2/3/2/1/236 MR, 260 MR & 479 EM
Mine Section and activities	**National Environmental Management Waste Act, 2008 (Act No. 59 of 2008)**	**Approved / Submitted**	**Reference number/s**
The expansion of a waste management activity listed in Category A or B of this Schedule which does not trigger an additional waste management activity in terms of this Schedule	Category A: Listed Activity 13	2017	NW 30/5/1/2/3/2/1/236 MR, 260 MR & 479 EM

Activities required for the proposed infrastructure:

Layout Plan

- See Figure 3 on the next page.

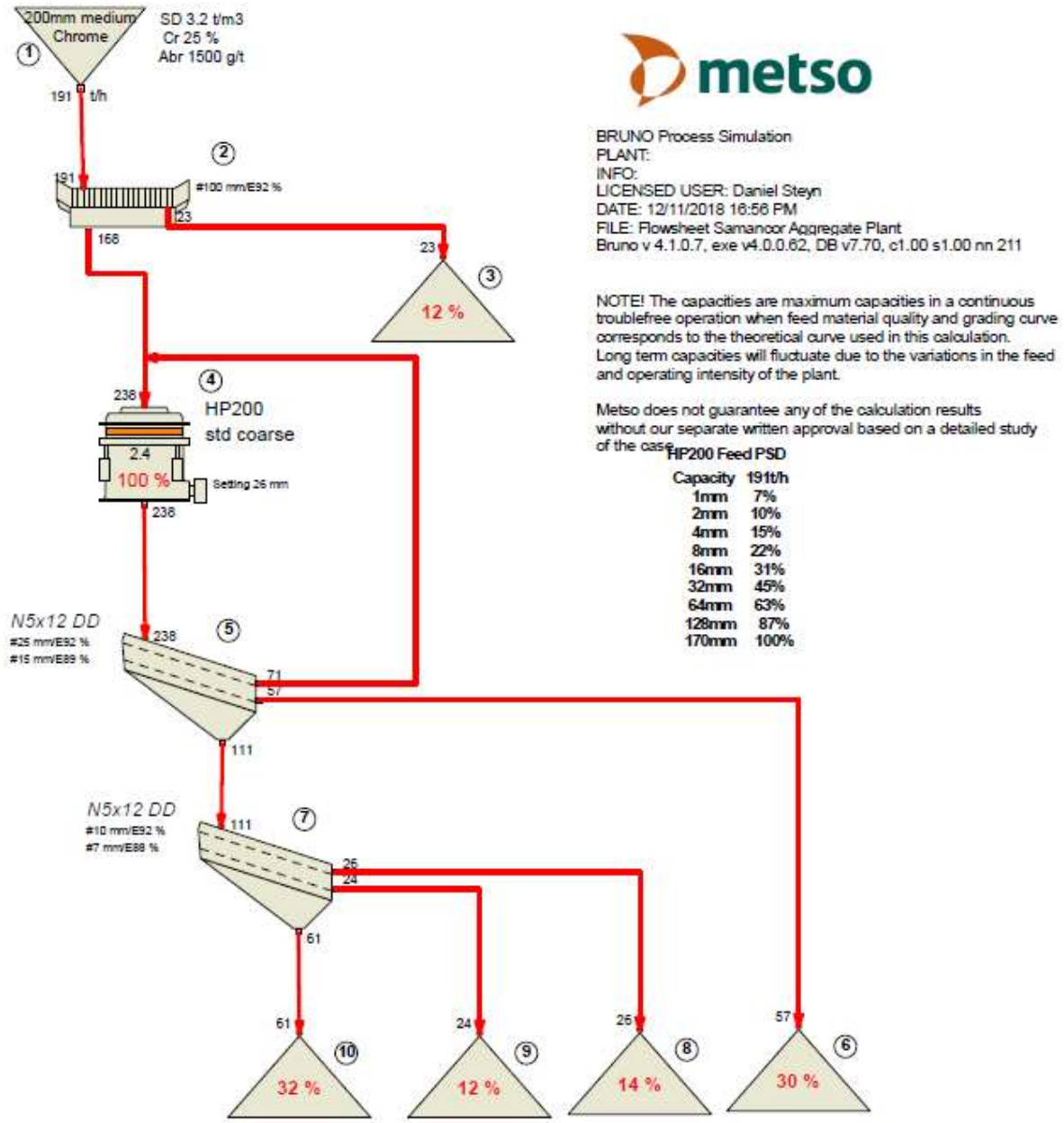


Figure 3: Locations of the proposed facility

The Site Plan is included in Appendix 3.

General description

e) Policy and Legislative Context

Table 4: Policy and Legislative Context

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED	HOW DOES THIS DEVELOPMENT COMPLIY WITH AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT.
Constitution of South Africa, 1996 (Act No. 108 of 1996) [as amended] • *Section 24* *Environment.-Everyone has the right-* *(a) to an environment that is not harmful to their health or well-being; and* *(b) to have the environment protected, for the benefit of present and future generations through reasonable legislative and other measures that-* *i) prevent pollution and ecological degradation;* ii) *promote conservation; and* iii) *Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.*	The proposed development 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 process products and thereby limiting the use of natural resources. The Applicant has the overall responsibility to ensure that the rights of people in terms of Section 24 of the Constitution is protected in terms of the proposed development activity	N/A
National Environmental Management Act (No. 107 of 1998) [as amended] • *Section 28 (1)* *Duty of Care and responsibilities to minimise and remediate environmental degradation.*	The Applicant is the developer and overall responsibility of the crushing and screening plant rests with him, especially in terms of liabilities associated with the operational phase.	N/A
EIA *Regulations, 2014 (Government Notices 982)* ***[as amended 2017]*** *Chapter 6: Regulation 39 to 44: Public Participation;* *Chapter 4: Application for Environmental Authorisation:* *Part 2 Basic Assessment Report* *Appendix 4: Environmental Management Programme* *Appendix 5: Closure Plan* *Appendix 6: Specialist Reports* *Appendix 7: Environmental Audit Report*	The EIA Regulations, 2014 prescribes *inter alia*: the manner in which public participation needs to be conducted as well as the requirements of a basic assessment process and the content of a basic assessment report and environmental management programme. The content of specialist reports, closure plans and environmental audit reports are also provided.	
EIA Regulations, 2014 (Government Notices 982, 983, 984) (Please refer to Table 2). The proposed construction, operational and closure activities of the proposed and existing waste activities triggers the following listed	Samancor has an existing Waste Management Licence (WML) for a Category A listed activity in GNR 921 of 29 November 2013: *"The expansion of a waste management activity listed in*	NEMWA (GNR. 633) Category A: Activity 15 The establishment or reclamation of a residue stockpile or residue deposit resulting from activities which require a prospecting right or mining permit,

activities that are listed in the EIA regulations for which a Basic Assessment (BA) process have to be conducted:	*Category A or B of this Schedule which does not trigger an additional waste management activity in terms of this Schedule [Listed Activity 13].* The proposed and existing waste activities at the mine is related to the activity requiring a mining right. Samancor Chrome have an existing mining right for the Millsell mine.	in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002). NEMWA (GNR. 921) Category A: Activity 2 The sorting, shredding, grinding, crushing, screening or bailing of general waste at a facility that has an operational area in excess of 1000m^2.
Mineral and Petroleum Resources Development Act, 2002 (Act. 28 of 2002) [as amended]:	Sections 16 and 22.	
National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) [as amended] • *Section 16* *General duty in respect of waste management;* • *Section 17;* *Reduction, re-use, recycling and recovery of waste;* • *Section 18; and* *Extended producer responsibility; and* • *Section 21* *General requirements for storage of hazardous and general waste.*	The development activities will produce general and hazardous waste which need to be managed and disposed of according to best practices such as recycling, safe storage, etc.	
List of Waste Management Activities that have, or are likely to have a detrimental effect on the environment as promulgated in terms of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) [as amended]	The proposed construction, operational and closure activities of the propose development triggers the listed activities listed in Table 2, that requires a BA Process to be conducted.	A Basic Assessment process is required and due to the activity being within a mining area, the competent authority is the Department of Mineral Resources.
Waste Classification and Management Regulations and Norms and Standards.	The construction and operational activities associated with the proposed activities shall be in accordance with the regulations and Norms and Standards.	
National Water Act, 1998 (Act No. 36 of 1998) [as amended] • Section 3 *Regulation of flow and control of all water* • Section 19 Prevention of pollution to watercourses • Section 21	Stormwater need to be managed properly in order to achieve prevention of pollution and hazards. The storage of waste rock may impact on ground water and surface water resources. GN 704 National Water Act, 1998 (Act No. 36 of 1998).	The water use activities associated with the proposed development requires compliance with the requirements of the NWA as listed under GN No. 19182. Water will be supplied from the existing Millsell operations for which a Water Use Licence have already been granted.
Mine Health and Safety Act, 1996 (Act No. 29 of 1996) [as amended] and associated regulations	The development activities will create an environment that is not safe and healthy for workers on	

• Chapter 2, Sections 2 – 4 Responsibilities of owner • Chapter 2, Sections 5 – 13 Responsibilities of manager; • Chapter 2, Sections 14 – 18; Documentation requirements; • Chapter 2, Section 19 – 20 and 22 to 24 Employee's rights and duties; and • Chapter 2, Section 21 Manufacturer's and supplier's duty for health and safety.	and visitors to the site. The act provides for measures to prevent threats to the health and safety of humans in the development area.	
National Heritage Resources Act, 1999 (Act No. 25 of 1999) [NHRA] • Section 44 (1); Preservation and protection of heritage resources; • Section 3 Types and ranges of heritage resources (i) (i); Objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens.	It is not expected that the proposed development will have an impact on heritage resources as the development will be constructed on an area already disturbed by mining related activities. Should heritage resources be uncovered, principles of the NHRA will be implemented.	
National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) [as amended] • Section 32 Control of dust • Section 34 Control of noise	Impacts on surrounding landowners need to be managed through dust and noise mitigation measures.	
National Dust Control Regulations, 2013 (Government Notice 827 of 2013) • *Section 3* *Dust fall standard* • *Section 4* *Dust fall monitoring program* • *Section 6* *Measures for control of dust* • *Section 7* *Ambient air quality monitoring (PM10)* • *Section 8* *Offences* • *Section 9* *Penalties*	Dust fall out (PM10 and PM2.5) are currently being monitored at the Millsell operations and need to continue to be monitored in accordance to the standards set out in the monitoring programme with the specified measures due to the Applicant being liable to offences and penalties associated with non-conformance to dust which may influence employees and surrounding landowners.	
Veld and Forest Fire Act, 1998 (Act No. 101 of 1998) [as amended] • Section 12 (1) Duty of the landowner to prevent fire from spreading to neighbouring properties.	Cautionary steps in avoiding the spread of fires to and from neighbouring properties.	

National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) [as amended] • Section 9 Norms and standards • Section 27 Delegation of power and duties • Section 30 Financial accountability • Section 43 Biodiversity management plans.	Indigenous vegetation needs to be protected and managed in accordance with management measures set out in the management plans developed for the mine and the Applicant need to ensure he is aware of and covers his liabilities.	
Alien and Invasive Species Regulations (Government Notice 598 of 2014) and Alien and Invasive Species List, 2016 in terms of NEMBA (Government Notice 864 of 2014)Notice 2 Exempted Alien Species in terms of Section 66 (1) • Notice 3 National Lists of Invasive Species in terms of Section 70(1) – List 1, 3-9 & 11 • Notice 4 Prohibited Alien Species in terms of Section 67 (1) – List 1, 3-7, 9-10 & 12	It is the responsibility of the Applicant to ensure that all prohibited plant and animal species are eradicated as far as possible.	
Conservation of Agricultural Resources Act (Act No.. 43 of 1983) • Section 5 Prohibition of spreading of weeds • Section 12 Maintenance of soil conservation works and maintenance of certain states of affairs • Section 16 Regional Conservation Committees	Listed invader/alien plants occurring on site which requires management measures to be implemented to strive to maintain the status quo environment, especially through the guidelines provided by the Regional Conservation Committee.	
Hazardous Substances Act, 1973 (Act 15 of 1973) [as amended] • Section 2 Declaration of grouped hazardous substances; • Section 4 Licensing; • Section 16 Liability of employer or principle • Section 9 (1) Storage and handling of hazardous chemical substances • Section 18 Offences	The Applicant must ensure the safety of people working with hazardous chemicals (specifically fuels), as well as safe storage, use and disposal of containers during the on-site operational phase together with the associated liability should non-compliance be at the order of the day.	
Hazardous Chemical Substances Regulations, 1995 (Government Notice 1179 of 1995)	Hazardous substances will be stored and utilised on the site and non-compliance to management	

• Section 4 Duties of persons who may be exposed to hazardous chemical substances • Section 9A (1) Penalties	measures will result in prosecution of the Applicant in terms of his liabilities to the socio-economic environment.	
All other relevant national, provincial, district and local municipality legislation and guidelines that may be applicable to the application. Some of these are discussed in the next section.		

f) Need and desirability of the proposed activities

(Motivate the need and desirability of the proposed development including the need and desirability of the activity in the context of the preferred location).

According to the Western Cape Department of Environmental Affairs and Development Planning's (WC DEADP) Guideline on Need and Desirability: EIA Guideline and Information Document Series (2011), to describe the need for a development, it must be determined whether it is the right time for locating the type of land use and/or activity being proposed. To describe the desirability for a development, it must be determined, whether it is the right place for locating the type of land use and/or activity being proposed. Need and desirability can be equated to the concept of wise use of land which can be determined through the question of what is the most sustainable use of land. In light of the above, the need and desirability of an application must be addressed separately and in detail answering *inter alia* the following questions:

Table 5: Need and desirability considerations

A) NEED (TIMING)		
QUESTION A1: Is the land use (associated with the activity being applied for) considered within the timeframe intended by the existing approved SDF agreed to by the relevant environmental authority?		The project is aligned with the objectives of the municipal Spatial Development Framework (SDF) and Integrated Development Plan (IDP) and will not compromise the integrity of these respective forward planning documents.
YES X	**NO**	
QUESTION A2: Should development, or if applicable, expansion of the town/area concerned in terms of this land use (associated with the activity being applied for) occur here at this point in time?		The proposed development will enable Samancor Chrome Millsell to operate effectively during the life of mine (LOM) and therefore benefit South Africa as a whole as well as for the local communities for e.g. employment provision and social upliftment will continue for longer.
YES X	**NO**	
QUESTION A3: Does the community/area need the activity and the associated land use concerned (is it a societal priority)?		The North West Province, Provincial Development Plan indicates that economy and employment is their number 1 priority. One of the objectives relating to this area is to lower the unemployment rate from 24 percent in

YES X	**NO**	2010 to 14 percent in 2020 and 6 percent in 2030. This requires an additional 770 500 jobs. Mining in particular should create 55 000 additional jobs by 2030 to sustain 218 000 direct jobs, which will represent 13.9 percent of the total provincial employment. This is a significant amount of jobs and the mine contributes towards this figure by creating new and sustaining existing jobs. Unemployment within the Bojanala Platinum District is similarly high. The Samancor Chrome Screening and Crushing Plant, will have a positive impact on the socio-economic conditions of the local communities. The operation will create several employment opportunities, diversify the local economy and improve the lives of residents of Ikemeleng community by enabling them to be self-sustaining. The operations will contribute towards the socio-economic development of the region as a whole through social-upliftment and job creation as primary agents.
QUESTION A4: Are the necessary services with the adequate capacity currently available (at the time of application), or must additional capacity be created to cater for the development?		All infrastructure for services and capacity is sufficient for the establishment of the Screening and Crushing Plant as the proposed development will be constructed on an area currently being used for mining related operations.
YES	**NO X**	
QUESTION A5: Is this development provided for in the infrastructure planning of the municipality, and if not, what will the implication be on the infrastructure planning of the municipality (priority and placement of services and opportunity costs)?		No municipal infrastructure will be required for the study area.
YES	**NO X**	
QUESTION A6: Is this project part of a national programme to address an issue of national concern or importance?		While in line with government's general plan of boosting the economy, uplifting our people from poverty and social wellbeing, this project does not form an official part of any formal national concern.
YES	**NO X**	
B) DESIRABILITY (PLACING)		
QUESTION B1: Is the development the best practicable environmental option for this land/site?		The study area has been transformed. Through implementing good practice environmental management measures and mitigation measures, it will ensure that both human and environment are not negatively affected by the development.
YES X	**NO**	
QUESTION B2: Would the approval of this application compromise the integrity of the existing approved and credible municipal IDP and SDF as agreed to by the relevant authorities?		The project is aligned with the objectives of the municipal Spatial Development Framework (SDF) and Integrated Development Plan (IDP) and will not compromise the integrity of these respective forward planning documents. The IDP has chosen Provincial Priority Areas that align with the NDP. Provincial Priority Area 6 (Environmental Sustainability) outlines that waste management must be effective and focus on recycling and re-use and value of the waste as a resource for socio-economic upliftment in line with the objectives of the proposed development.
YES	**NO X**	
QUESTION B3: Would the approval of this application compromise the integrity of the existing environmental management		According to the North West Province Biodiversity Conservation Assessment Technical Report Version 1.2 (Desmet, Schaller & Skwono, 2009), the study area does not fall within a Critical Biodiversity Area (CBA).

priorities of the area (e.g. as defined in EMFs), and if so, can it be justified in terms of sustainability considerations?		The study area consists of previously cultivated land and mining infrastructure and therefore very little to none natural vegetation exists on the study area. The degree of potential negative impacts of the proposed activity on these features and possible sensitive features/species existing on site is minimal. These impacts were assessed in detail during the Environmental Impact Assessment (EIA) phase of the application, (Refer to Tables 12 – 15 and 19 of this report and prevention and mitigation measures are recommended in the EMPR (refer to Part B this report). Air quality is a major problem in Rustenburg, especially due to mining activities. In Rustenburg, the ambient air quality guidelines/criteria for some criteria pollutants are often exceeded. It is unlikely that these pollution levels will cause any life threatening impacts. However, residual impacts that may be caused include: financial consequences like increased health care costs or absence from work not to mention dissatisfaction of communities and quality of life (Bryszewski & Visser, 2004). The proposed and existing waste management activities will undoubtedly contribute to a slight increase in air quality pollution levels, without proper mitigation. However, with proper mitigation measures i.e. dust suppression and monitoring plans implemented, it probably will not increase. Impacts were assessed in detail during the Environmental Impact Assessment (EIA) phase of the application, (Refer to Tables 12 – 15 and 19 of this report and prevention and mitigation measures are recommended in the EMPR (refer to Part B this report). The measures and requirements of the Provincial Air Quality Management Plan of North West (Bembani, 2009) should also be implemented.
YES	**NO X**	
QUESTION B4: Do location factors favour this land use (associated with the activity applied for) at this place, etc.)?		No location alternatives for the crushing and screening plant are applicable to this project, since the proposed alternative is located within the existing mining area. No site alternatives for the crushing and screening plant are applicable as the portions onto which the plant will be constructed, is immediately adjacent to the existing Waste Rock Dump and is already disturbed. The localities of the proposed development also mean that transport will not increase in other areas, unnecessarily to and from the existing facilities. The new crushing and screening plant, will also be located on the footprint area of the previous mining related activities. The current option will require the least amount of invasive construction processes and is also the only cost-effective option.
YES X	**NO**	
QUESTION B5: Will the activity or the land use associated with the activity applied for, impact on sensitive natural and cultural areas (built and rural/natural environment)?		The proposed site for the crushing and screening plant is located within an area which is already disturbed as a result of agricultural and extensive mining activities. The proposed development will be located within the mining areas. Therefore, the only significant impact of the activities expected, is an increase in air, noise and visual pollution and possibly water pollution if operations are not managed effectively.
YES	**NO X**	
QUESTION B6: Will the development impact on people's health and wellbeing (e.g. in terms of noise, odours, visual character and sense of place, etc.)?		Noise, dust and visual pollution will slightly increase, and possibly water pollution, if impacts are not managed effectively, but with the proper mitigation and good practice environmental management measures, it will result in minimal impacts. Impacts were assessed in detail during the Environmental Impact Assessment (EIA) phase of the application, (Refer to Tables 12 to 15 and 19 of this report and prevention and mitigation measures are recommended in the EMPR (refer to Part B this report).
YES X	**NO**	

QUESTION B7: Will the proposed land use result in unacceptable cumulative impacts?	As already mentioned, through the implementation of good practice environmental management measures as well as mitigation measures, all direct and cumulative impacts which may result from the proposed development will be addressed and ensure that the environment is affected to the minimum. The potential cumulative impacts were assessed in detail during the Environmental Impact Assessment (EIA) phase of the application. Refer to Tables 12 to 15 and 19 of this report. Prevention and mitigation measures are recommended in the EMPR (refer to Part B this report).

The main benefits of the Millsell mine are that:

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

The proposed Community Waste Rock Beneficiation Facility will help Millsell achieve their objectives, contributing to the benefits mentioned above of:

- Diversifying the local economy;
- Creating job opportunities for women and youth; and
- Improving the lives of residents of the Ikemeleng community by enabling them to be self-sustaining.

The project is aligned with the objectives of the municipal Spatial Development Framework (SDF) and Integrated Development Plan (IDP), as well as the Provincial Strategic Priority including job creation, investment creation, rural and urban development, combating crime, skills development, combating the impact of HIV/AIDS and poverty alleviation. The Social and Labour Plan (SLP) drafted for the proposed project addresses all these priorities.

g) Motivation for the preferred development footprint within the approved site including a full description of the process followed to reach the proposed development footprint within the approved site.

NB!! – This section is about the determination of the specific site layout and the location of infrastructure and activities on site, having taken into consideration the issues raised by interested and affected parties, and the consideration of alternatives to the initially proposed site layout.

i) Details of the development footprint alternatives considered

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

(a) the property on which or location where it is proposed to undertake the activity;
(b) the type of activity to be undertaken;
(c) the design or layout of the activity;

(d) the technology to be used in the activity;

(e) the operational aspects of the activity; and

(f) the option of not implementing the activity.

According to the Western Cape Department of Environmental Affairs & Development Planning (WC DEADP) Guideline on alternatives: EIA Guideline and Information Document Series (2011) feasible and reasonable alternatives have to be identified for a development as required by the NEMA EIA Regulations and applicable to EIA. Each alternative is to be accompanied by a description and comparative assessment of the advantages and disadvantages that such development and activities will pose on the environment and socio-economy. Alternatives forms a vital part of the initial assessment process through the consideration of modifications in order to prevent and/or mitigate environmental impacts associated with a particular development. Alternatives are to be amended when the development's scope of work is amended. It is vital that original as well as amended alternative identification, investigation and assessment together with the generation and consideration of modifications and changes to the development and activities are documented.

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

Feasible alternatives

The following alternatives were investigated as feasible alternatives:

- *Design alternatives;*
- Recycling *(Technology alternatives);* and
- Not implementing the activity *(No – Go alternative).*

Table 6 below contains the analysis of alternatives identified.

Table 6: Alternatives Analysis

TYPE OF ALTERNATIVE: **Location**	**ALTERNATIVE EXPLANATION:** **Develop on an alternative property** **Develop on alternative sites on the same property/properties**
No location alternatives for the proposed development are applicable to this project, since the proposed alternative is located within the existing mining area. No site alternatives for the Community Waste Rock Beneficiation Plant are applicable as the portions onto which the development is proposed, is immediately adjacent to the existing Waste Rock Dump and is already disturbed. The proposed localities of the proposed development, also means that transport to and from the existing facilities, will not expand to other areas.	

TYPE OF ALTERNATIVE: Activity	ALTERNATIVE EXPLANATION: Develop an alternative activity e.g. Incineration of waste vs. landfill disposal, abstraction of water vs. re-use/recycling of water.
No activity alternatives have been identified or are assessed as part of this application.	
TYPE OF ALTERNATIVE: Design	**ALTERNATIVE EXPLANATION: Adapt architectural and/or engineering designs.**
No design alternatives have been identified as the proposed design will have the smallest environmental impact, will be most cost-effective and will serve the Ikemeleng community.	
TYPE OF ALTERNATIVE: Layout	**ALTERNATIVE EXPLANATION: Adapt spatial configurations of an activity on any particular site e.g. Locate manure dams away from water resources.**
As described under the "Design alternative" section, the current design considered the different available layout options and the current design will have the smallest environmental impact, will be the most cost-effect and will serve the most communities as a public road. The proposed Community Waste Rock Beneficiation Plant will also be located on the footprint of the previous waste rock dump where it will have the least impact on the environment.	
TYPE OF ALTERNATIVE: Technological	**ALTERNATIVE EXPLANATION: Adapt methods or processes that can be implemented to achieve the same goal e.g. Introduction of bacteria rather than chemicals to waste water.**
The current proposed Waste Rock Beneficiation Plant is the preferred alternative to utilizing the area for a waste rock stockpile (as previously authorised) and rehabilitating the area once the life of mine is completed. The proposed development will be beneficial to the local community, while at the same time, implementing recycling practices. Recycling: The mine will in the operational phase of the beneficiation plant, implement recycling policies and measures for optimal utilisation of resources and minimisation of waste generation. Water: Water utilisation will be maximised through internal recycling of dirty water within the process operations.	
TYPE OF ALTERNATIVE: Demand	**ALTERNATIVE EXPLANATION: The demand for products and/or services can be met by other means e.g. The demand for paper can be met through deforestation or rather by efficient and viable recycling.**
No alternatives to meet demand were identified or are assessed in this application.	
TYPE OF ALTERNATIVE: Input	**ALTERNATIVE EXPLANATION: Implement different input materials and/or sources e.g. Utilisation of woodchips for fuelling boilers rather than electricity.**
No input alternatives were identified or are assessed in this application.	
TYPE OF ALTERNATIVE: Routing	**ALTERNATIVE EXPLANATION: Implement alternative routes for linear developments such as power line servitudes, transportation and pipeline routes e.g. Elongate and divert a railway line to exclude a sensitive environment.**
No routing alternatives were identified or assessed in this application.	
TYPE OF ALTERNATIVE: Transport	**ALTERNATIVE EXPLANATION: Method of transportation of product or ore.**
This alternative is not applicable to the proposed development.	
TYPE OF ALTERNATIVE: Scheduling and Timing	**ALTERNATIVE EXPLANATION: Adapt the order and/or scheduling of a number of measures which plays a part in a program as it will influence the overall effectiveness of the end result.**

This alternative is not applicable to the proposed development.	
TYPE OF ALTERNATIVE: Scale	**ALTERNATIVE EXPLANATION: Adapt the scale of an activity ex. 15 vs. 35 housing units, 12m2 vs. 0.5km2. P.S. Scale and magnitude is interrelated.**
At this stage, no alternatives in terms of scale have been identified or are assessed. The area proposed for the development has already been disturbed and utilize the available area in the most efficient way, by minimising impacts on the surrounding environment.	
TYPE OF ALTERNATIVE: Magnitude	**ALTERNATIVE EXPLANATION: Adapt the magnitude which is directly related to the extent of an activity. P.S. Scale and magnitude is interrelated. An activity may be very small scale but can pose an extensive magnitude ex. Destroying an extremely sensitive wetland on a very small scale could result in a magnitude of such as destroying the whole wetland and/or ecological system.**
At this stage, no alternatives in terms of magnitude have been identified or are assessed.	
TYPE OF ALTERNATIVE: No-Go	**ALTERNATIVE EXPLANATION: The option of not undertaking and implementing the activity at all.**
The socio-economic environment will not benefit from the mining activities, should the proposed activities not be implemented. These benefits include: • Diversifying the local economy • Creating job opportunities for women and the youth • Improving the lives of residents of Ikemeleng community by enabling them to the self-sustaining by providing: - Training - Skills development - Mentoring - Coaching - Creating spin-off opportunities by training local SMME's to erect concrete palisades and other products.	

ii) Details of the Public Participation Process Followed

Describe the process undertaken to consult interested and affected parties including public meetings and one on one consultation. NB! The affected parties must be specifically consulted regardless of whether or not they attended public meetings. Information to be provided to affected parties must include sufficient detail of the intended operation to enable them to assess what impact the activities will have on them or on the use of their land.

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

The benefits of public participation include the following:

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

The Public Participation Process (PPP) for the proposed development of the Community Waste Rock Beneficiation Facility is undertaken to ensure compliance with regard to the requirements in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) [as amended] (MPRDA), the National Environmental Management Act, 1998 (Act No. 107 of 1998) [as amended] (NEMA), the National Environmental Management: Waste Act, 2008 (Act No 59 of 2008) [as amended] (NEMWA), and the Environmental Impact Assessment Regulations (2014).

Tasks undertaken for the Public Participation Process (PPP)

This section of the report provides an overview of the tasks undertaken for the PPP to date. All PPP undertaken is in accordance with the requirements of the NEMA requirements and EIA Regulations (2014) [as amended]. It further provides an outline of the next steps in the PPP and makes recommendations for tasks to be undertaken during the environmental assessment phase of the environmental authorisation process.

The PPP tasks conducted for the proposed new plant development project to date includes:

IDENTIFICATION OF KEY INTERESTED AND AFFECTED PARTIES (AFFECTED AND ADJACENT LANDOWNERS) AND OTHER STAKEHOLDERS (ORGANS OF STATE AND OTHER PARTIES)

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

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

- National, provincial and local government;

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

FORMAL NOTIFICATION OF THE APPLICATION TO INTERESTED AND AFFECTED PARTIES (INCLUDING ALL AFFECTED AND ADJACENT LANDOWNERS) AND OTHER STAKEHOLDERS

The project was announced as follows:

- Newspaper advertisement.

Publication of media advertisement (English) in the **Rustenburg Harold** on **9 November 2018.**

Please refer to Appendix 5.1 for Proof of the media advertisement.

- Site notice placement

In order to inform surrounding communities, affected and adjacent landowners of the proposed development, twelve site notices were placed on site and at visible locations close to the site on **14 November 2018**. *Please refer to Appendix 5.2 for Proof of site notices.*

- Written notification

I&AP's and other key stakeholders, who included the above-mentioned sectors, were directly informed of the proposed development by e-mail on **14 November 2018**. This Draft BAR and EMPr is also supplied concurrent with the registration and comment process to all parties. Copies of the Draft BAR are also submitted to all Organs of State and relevant authorities. In addition, one hard copy is placed at the Rustenburg Public Library, Address: Heystek Street, Rustenburg, Tel no: 014 590 3294 and on Environmental Assurance's website: www.envass.co.za/downloads. (Username: envass, Password: 217#). The public participation process will run for 30 days during which time I&APs are given the time to comment and / or raise issues of concern regarding the proposed development. The commenting period will expire on Friday, **14 December 2018**. *Please refer to Appendix 5.3 for Proof of written notice sent.*

CONSULTATION AND CORRESPONDENCE WITH I&APS AND STAKEHOLDERS

All I&AP registrations and comments that are received from stakeholders is formerly recorded in the Comments and Responses Report. *Please refer to Appendix 5.4* ***(not yet updated in this draft)***

- Public Participation Meeting

A public participation meeting will be held on 22 November 2018. All potentially Interested and Affected Parties and Stakeholders, including relevant Organs of State will be invited to the public meeting. All comments received at the meeting will be addressed and records of the meeting will be kept and included in the Final BAR report to be submitted to the Competent Authority (CA), Department of Mineral Resources. Proof will be included in the final report in Appendix 5.5 *(not yet updated in this draft)*.

NEXT PHASES OF THE PUBLIC PARTICIPATION PROCESS

All stakeholders and registered I&APs now have the opportunity to review and comment on all the documents released in the Basic Assessment Process. The BA / EMPR report is released for a period of 30 days from 14 October 2018 to 14 November 2018 for review and comment. Hardcopies and / or CDs of all reports and supporting documents are submitted to the organs of state and relevant authorities (Appendix 5.6). All the reports are placed in an area that is accessible to all I&APs and they will be notified of the location i.e. the Rustenburg Public Library. The reports are also available for download from the ENVASS website (www.envass.co.za).

iii) Summary of issues raised by I&AP's

(Complete the table summarising comments and issues raised, and reaction to those responses)

TO BE COMPLETED ONCE THE PPP PROCESS ENDS ON 14 DECEMBER 2018.

Table 7: Comments and issues raised and reaction to responses

INTERESTED AND AFFECTED PARTIES List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted		DATE COMMENTS RECEIVED	ISSUES RAISED	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
AFFECTED PARTIES					
Landowner/s					
	☐				
	☐				
Lawful occupier/s of the land					
	☐				
Landowners or lawful occupiers on adjacent properties					
	☐				
Municipal councillor (if more than one, attach list as an Annexure)					
	☐				
Municipality (if more than one, attach list as an Annexure)					
	☐				
Organs of state (Responsible for infrastructure that may be affected Roads Department,					

Eskom, Telkom, DWA e					
Communities					
Dept. Land Affairs					
Traditional Leaders					
Dept. Environmental Affairs					
Other Competent Authorities affected					
OTHER AFFECTED PARTIES					
INTERESTED PARTIES					

iv) The Environmental attributes associated with the development footprint alternatives

(The environmental attributed described must include socio-economic, social, heritage, cultural, geographical, physical and biological aspects)

(1) Baseline Environment

The study area is located on Portion 410 of the Farm 305 JQ within the boundaries of the Madibeng Local and Bojanala District Municipality in the North West Province. Portion 410 is located approximately 7 km south-east of the town of Rustenburg, north-west of Mooinooi and north of the Magaliesberg Mountain Range at GPS coordinates: 25°41'49.18"S, 27°17'16.57"E.

Samancor Chrome Millsell mine was granted an authorisation for the storage of waste rock on the portion proposed for the development of the Community Waste Rock Beneficiation Facility. The study area has been disturbed by current mining activities.

(a) Type of environment affected by the proposed activity.

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

CLIMATE

Regional Climate

Rustenburg is located in the Highveld Climatic Zone, which is a temperate climate with a summer rainfall season. Temperatures vary between a minimum of 3°C in winter to maximum of 30°C in summer. The mean annual rainfall is 650 mm in the western region and 900 mm in the eastern region of the zone.

Precipitation is mainly in the form of thunderstorms in the summer months (October to March). Thunderstorms appear frequently and are often violent with severe lightning and strong winds, with occasional hail. The winter months (April to September) are normally dry.

Local Climate

The mean maximum temperature for Rustenburg is between 19.3ºC in June and 29.4ºC in January, and the mean minimum temperatures is 1.7ºC in July and 16ºC in January. The closest Department of Water and Sanitation (DWS) station is AE008, of which the data indicates that the study area receives a mean annual rainfall of 642 mm and the mean annual evaporation is measured at 2 043 mm.

The predominant wind direction in the region is South-southeast, and the maximum average wind speed is 4 metres per second (classified as a "gust"). Gusty wind speeds, on average 5 metres per second, can be expected between August and October. Between January and July, calm wind conditions prevail, with wind speeds alternating between 3 and 4 metres per second.

GEOHYDROLOGY

Unless otherwise stated, the following information was retrieved from the Geohydrological Impact Assessment for the proposed project (Waters Without Frontiers, 2016)

Topography and Drainage

The study area is situated in the quaternary drainage catchment A22H of the Crocodile West and Marico Water Management Area (WMA) (now known as the Limpopo WMA). The topography is characterised by very flat terrain, with the project area located between 1 140 and 1 160 metres above mean sea level (mamsl). The general surface gradient ranges from 0.01 to 0.02 in a north-easterly direction. The most prominent geomorphological feature in the area is the Magaliesberg Mountain range, which arches from west of Rustenburg, to the south of the study area. The Magaliesberg Mountain range rises to approximately 1 800 mamsl. The project area is drained by the Hex River and its tributaries, rising in the Magaliesberg and flowing towards the north-east.

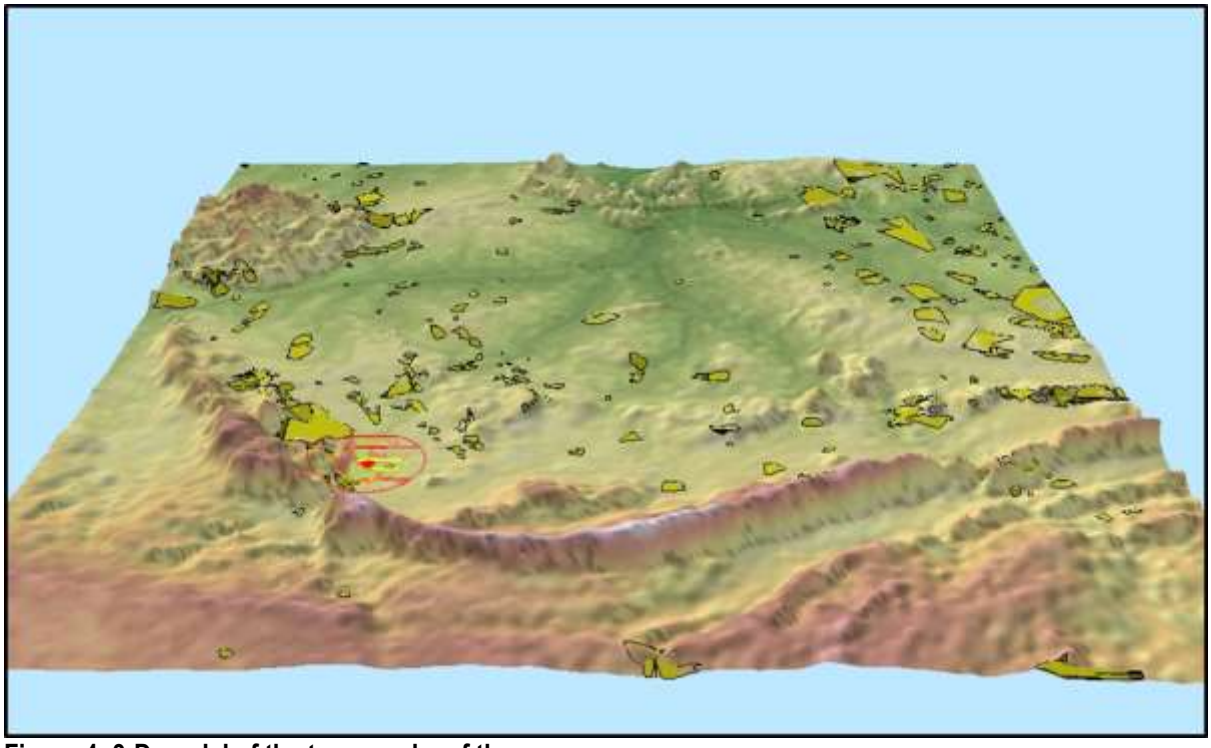


Figure 4: 3-D model of the topography of the area

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 are the Crocodile itself (across the area of Brits), the Elandspruit, and the Sterkstroom (across the area of Mooinooi/Marikana) and the Hex River (across the area of

Kroondal/Rustenburg). This whole drainage system cuts across, perpendicularly, the narrow and elongated strips of the geological, edaphic and vegetation formations of the area.

Soil, Land Capability and Land Use

This section has been extracted from the Millsell / Waterkloof Environmental Management Programme, 2010.

Soil Types

The soil forms and families identified on WCM properties are indicated in Table 8. Pre-mining land use was exclusively for agricultural purposes. No new areas will be disturbed for mining activities.

Table 8: 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.

Soil Fertility and erodibiliity

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.

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.

Soil Potential (dry land / irrigation / grazing)

The potential of each soil is indicated in Table 9.

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.

Pre-Mining Land Capability

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 9 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 9: 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.

Wetlands

No wetland soils are present on the site.

Wilderness Land

No wilderness land is present on the site.

Pre-Mining Land Use

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 maze, 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.

The Magaliesberg mountain range is a protected nature conservation area known as the Magaliesberg Protected Natural Environment. This area runs from east to west between Pretoria and Rustenburg. Activities of WCM will not encroach on this area.

Geological Setting

Regional Geology

Regionally, the study area is underlain by the Bushveld Igneous Complex (BIC), comprising ultramafic rocks, granophyres and granites which form the basis of the present three-fold subdivision of the complex into the Rustenburg Layered Suite, the Rashoop Granophyre Suite and the Lebowa Granite suite, respectively. The various rock units of the Bushveld Complex have a generally tabular shape and are more or less conformably overlying each other with the basic rocks at the base overlain by the granophyres and the granites. The Bushveld Complex covers large tracts of the North-West, Gauteng, Mpumalanga and Limpopo provinces. The regional stratigraphical sequence is indicated in Table 10 and Figure 5 and below.

Table 10: Lithostratigraphical sequence of the study area (WWF, 2016)

Erathem (geological period)	Lithology	Stratigraphy		
		Formation	Group	Complex: Supergroup
Cenazoic	Sand, calcrete	Quaternary Deposits		
Paleozoic	Dolerite	Intrusion		KAROO SUPERGROUP
	Mudstone, Sandstone	Ilrrigasie	Ecca Group	
Mokolian	Syenite, Foyaite and Carbonatite		Pilanesberg Complex	ALKALINE COMPLEX
	Granite		Lebowa Granite Suite	**BUSHVELD IGNEOUS COMPLEX**
Vaalian	**Gabbro, Norite, Anorthosite, Pyrexonite**		**Rustenburg Layered Suite**	
	Granodiorite		Rashoop Granophyre	
	Diabase	Intrusion		TRANSVAAL SUPERGROUP
	Andesite	Dullstroom	Pretoria	
	Shale and Sandstone	Rayton		
	Quartzite	Magaliesburg		
	Shale	Silverton		
	Quartzite	Dapoort	Chuniespoort	
	Dolimite, Chert			

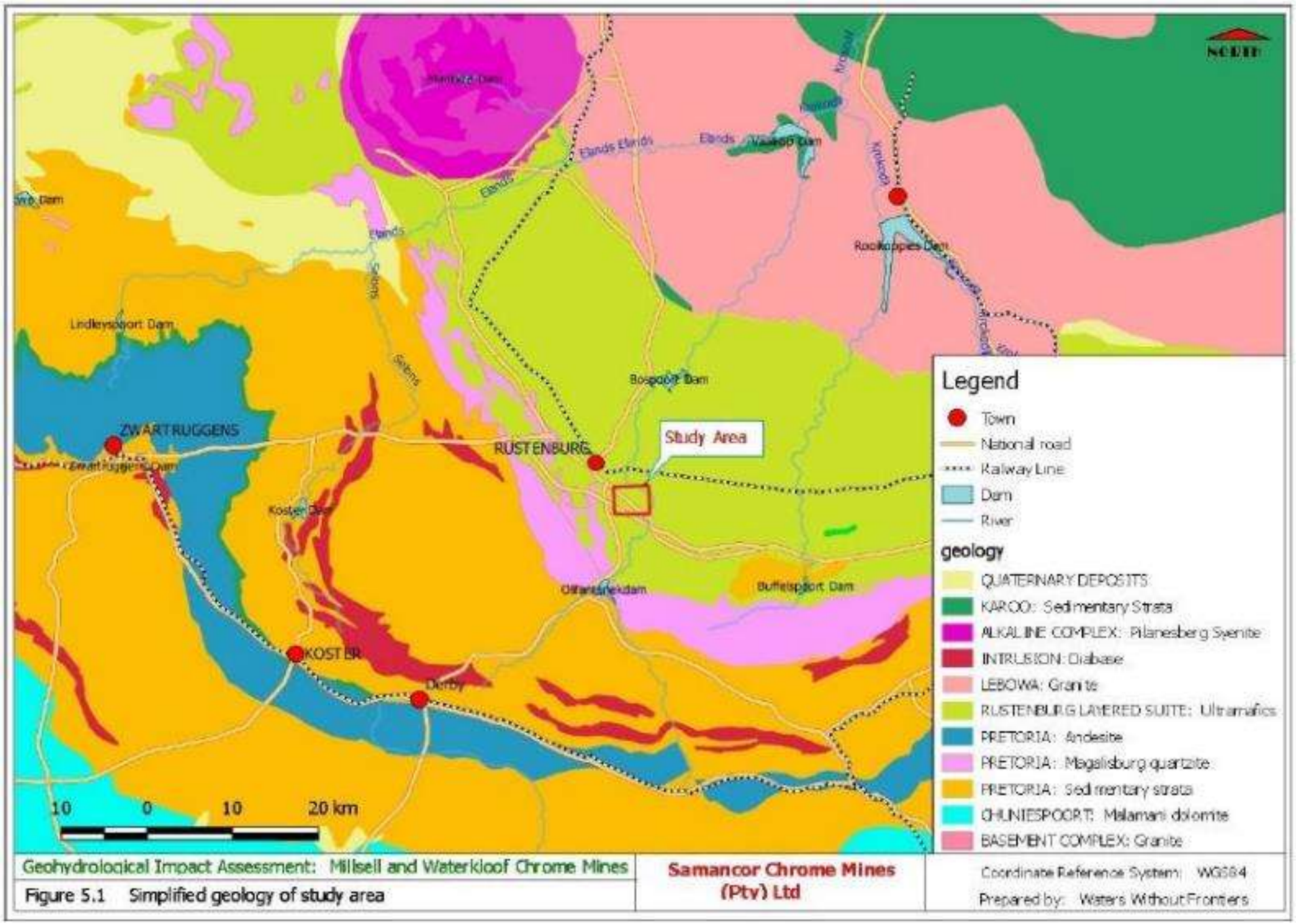


Figure 5: Simplified Geology of the Study Area (WWF, 2016)

Local Geology

Locally, the study area is underlain by ultramafic rocks collectively known as the Rustenburg Layered Suite (RLS), highlighted in Figure 5 above. The layered structure of the suite is the result of crystal accumulation at the base of the intrusion coupled with fractional crystallisation. It is believed that the emplacement of the rocks took place in a series of pulses. The suite consists of rocks that range from ultramafic pyroxenites and anorthosites in the lower parts to norite, gabbro, and magnetite gabbro in the upper parts. The project area is dominated by rocks of the lower part of the suite. The RLS has been subdivided, from base to top, into five zones, known as the Marginal, Lower, Critical, Main and Upper Zones. The Critical Zone is the host to all chromium and PGM mineralisation within the BIC. It is made up of cyclic units consisting of chromitite, pyroxenite, norite and anorthosite. 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 of 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 thickest chromitite layers, specifically the LG6 and MG1, are mined for their chrome content.

Structural Geology

The Rustenburg Layered Suite 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.

Hydrogeology

Groundwater is a very important water resource in the study area, and is used for domestic supply in agricultural properties surrounding the mines. Rocks of the Rustenburg Layered Suite are characterised by a well-developed layering. They consist mainly of ultramafic rocks that include norite, gabbro, anorthosite and pyroxenite. Groundwater occurrence and movement are associated with deeply weathered and fractured zones within an otherwise naturally impermeable rock mass. These rocks have variable susceptibilities to weathering, with norites weathering more easily than the others (Odendaal, 1983). There is generally a gradual transformation from the weathered zone to the fresh rock. Fractures allow weathering to penetrate deeper into the fresh solid rock. The layering of Rustenburg Layered Suite is a result of fractional crystallisation. The contacts between the layers are generally tight and closed, with little influence on groundwater movement. Previous studies in the area have distinguished two aquifer systems comprising a shallow weathered aquifer and a deeper fractured aquifer. However, this distinction may not necessarily be accurate, as the groundwater body extends from the weathered zone into the fractured zone as one continuous entity. In other words, there is a single aquifer extending from the weathered and fractured zone to the predominantly fractured zone, in fresh rock.

The presence of dolerite intrusions (dykes and sills) in the area influences groundwater movement in both positive and negative ways. The emplacement of the dolerite intrusion displaces and fractures the host rock, thereby increasing permeability around the intrusion. Shrinkage fractures that develop at the contact between the dolerite intrusion and the host rock due to the rapid cooling on contact with the cold host rock, greatly enhance the permeability of this zone. On the negative side, compact dolerite dykes act as impermeable barriers to groundwater flow, when oriented perpendicular to the flow direction, causing groundwater to dam behind the dykes. Compact sills prevent or reduce groundwater recharge.

Groundwater characteristics of the area were derived by the specialist, from the statistical analysis of data from the national groundwater archive for broader area (Barnard, 2000). The statistical analysis results, are given in the geohydrology report in Table 6.1 (Appendix 7). The study area is classified as having low to medium groundwater potential, characterised by borehole yields in the range 0.5 to 2 l/s. Higher borehole yields, greater than 5 l/s, are however not uncommon, where well-developed fracture zones and faults are intersected. Water strikes occur in the depth range 5 – 50 metres below surface range.

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/annum for the study area (Seymour and Seward, 1996 as cited by WWF, 2016). Groundwater recharge is estimated at between 32 and 45 mmm per annum (Vegter, 2001 as cited by WWF, 2016). The natural groundwater quality in the area is generally good, and falls within DWS water quality guidelines for domestic use. Typical groundwater chemistry of the Rustenburg Layered Suite as derived from the statistical analysis of 73 samples (Barnard, 2000 as cited by WWF, 2016), is given in Table 11 below (Table 6.2 of the geohydrology report) (Appendix 7).

Table 11: Typical Groundwater Chemistry of the Rustenburg Layered Suite

ELEMENT / PARAMETER	Minimum Value	Mean Value	Maximum Value
pH	6.2	7.7	9.7
Electrical Conductivity (mS/m)	3.7	105	384
Total Dissolved Salts (mg/l)	52	760	2828
Calcium (mg/l)	5	99	428
Magnesium (mg/l)	2	56	231
Sodium (mg/l)	3	45	179
Potassium (mg/l)	.1	2.7	33
Chloride (mg/l)	2	94	570
Sulphate (mg/l)	1	174	1850
Total Alkalinity (mg/l)	9	219	532
Nitrate (mg/l)	0.1	10.6	81
Fluoride (mg/l)	0.1	0.3	2.2
Langelier Saturation Index (LSI)	-2.8	-0.1	0.8
Sodium Adsorption Ratio (SAR)	.2	1.1	10.4

Methodology and Findings

Previous studies

The specialist reviewed previous groundwater studies that have been conducted at the Mine. These include the following:

- Geyhydro Technologies (1999);
- Geotechnical Consulting Services (2004);
- M2 Environmental Connections CC (2010);
- Vuka Africa (2011); and
- Waters Without Frontiers (2015).

Hydrocencus

During the application for authorisation for the Tailings Dam and Waste Rock Dump (2015), the specialist conducted a hydrocensus within a radius of 2 km of the mine. Twenty seven existing boreholes were identified and sampled. The boreholes are monitoring boreholes of Samancor Chrome Limited, as well as privately owned boreholes on adjacent properties (please refer to Figure 6 below)

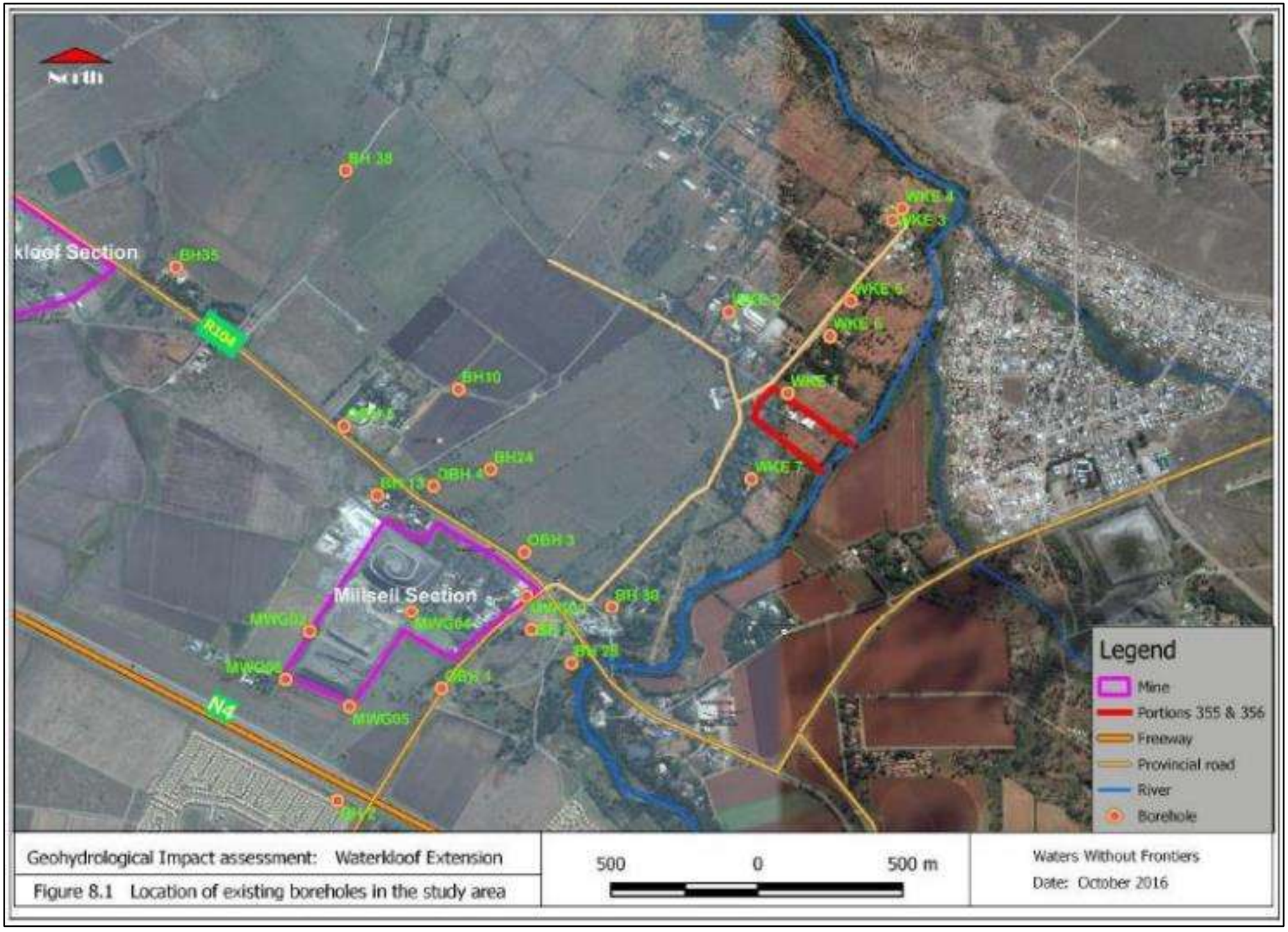


Figure 6 : Location of existing boreholes in the area (WWF, 2016)

Groundwater Levels

The depth to the water table was calculated from 25 boreholes, with measured water levels. The water table depth ranges from 2.6 to 19.2 metres, with the shallower water levels being closer to the Hex River. The map compiled by the geohydrologist, indicates areas where groundwater has been drained completely from the rocks (please refer to Figure 7 below). The fracture / fault system in this area is connected to the shaft, resulting in groundwater freely draining into the shaft. This was derived from the sound of underground mining activities that can be heard from two boreholes. In addition, air being sucked into the underground can be heard from another borehole. Groundwater levels in the area of the proposed study area, are relatively undisturbed with water levels between 10 and 16 metres below surface.

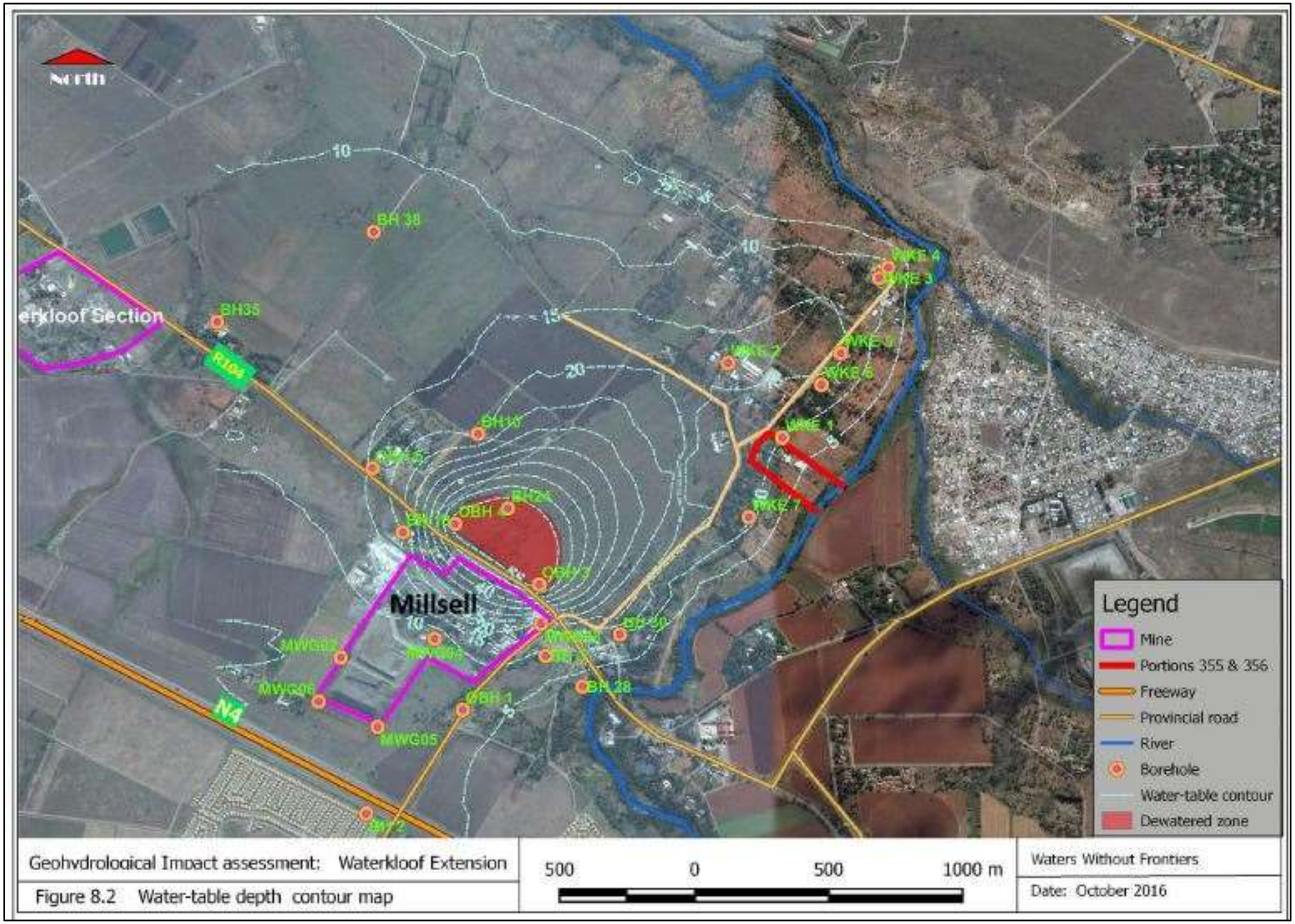


Figure 7: Water-table depth contour map (WWF, 2016)

Groundwater Flow

Water level data were also used to create piezometric surface map around the site to determine groundwater flow patterns (please refer to Figure 8 below). The piezometric contours closely mimic those of the depth to the water table above. The natural groundwater flow has been significantly impacted on in the vicinity of boreholes OBH 3, OBH 4 AND BH 24 (refer to Figure 8), for the same reasons as described above. Groundwater generally flows in a north-easterly direction, ultimately discharging as baseflow into the Hex River.

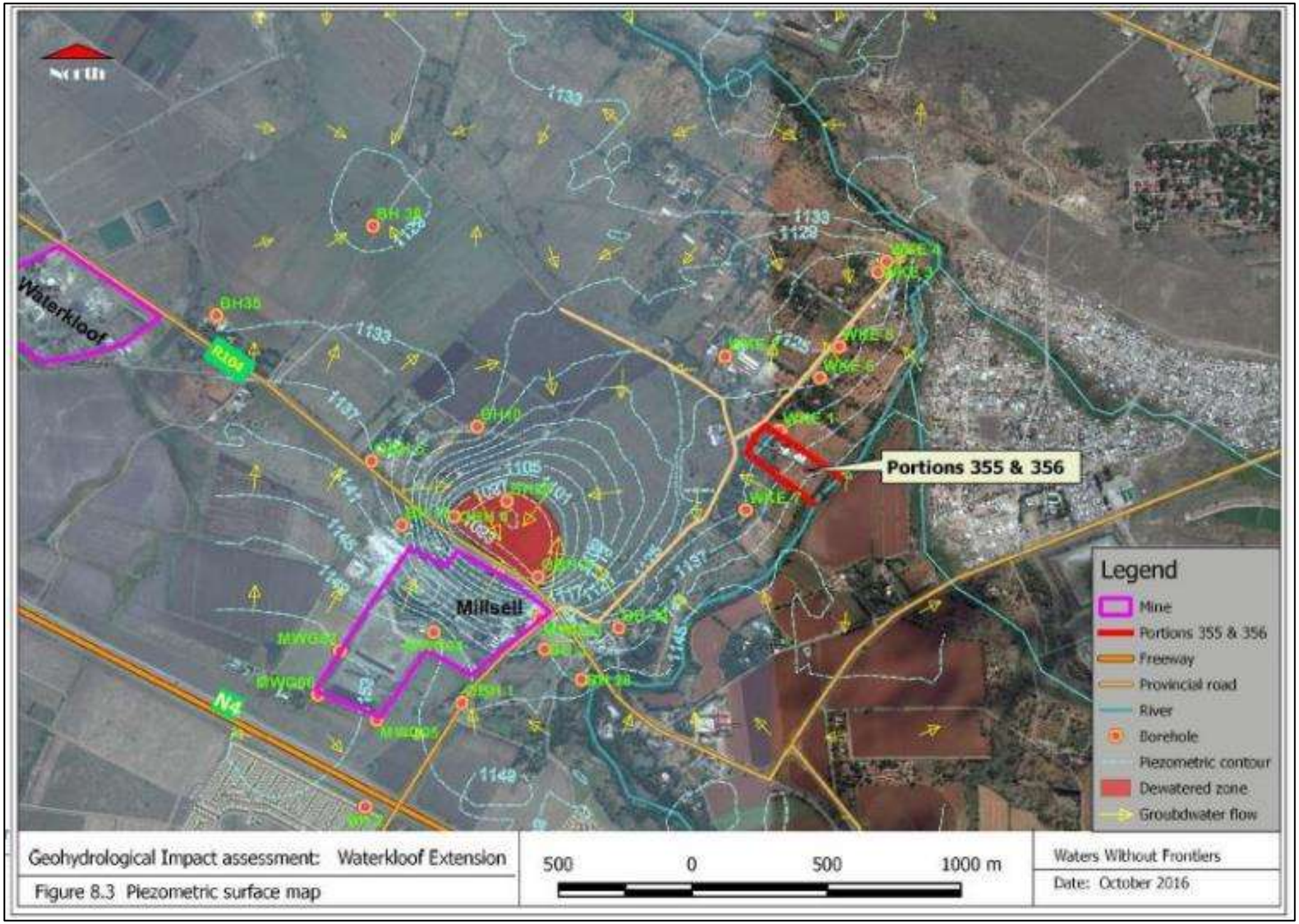


Figure 8: Piezometric surface map (WWF, 2016)

Groundwater Quality

Available groundwater quality data is confined to boreholes in the vicinity of the Millsell Section of the Samancor Mine (refer to Appendix 7). No water quality data could be found for private boreholes around the study area.

Surface Water

Surface Water Impact Assessment for the proposed project (Waters Without Frontiers, 2015)

The study area is located within the Crocodile West and Marico Water Management Area which is situated primarily within the North West Province, but also extends over the northern area of Gauteng and the southwestern corner of Limpopo.

The quaternary catchment is A22H of the Crocodile West and Marico Water Management Area, of which the Magaliesberg Mountain range forms the southern boundary. The catchment is approximately 590 km2 in size. The topography of the catchment is characterised by relatively flat terrain, sloping slightly from north to east. The study area is located between the Hex River, approximately 1 km to the east and a stream, approximately 600m to the west.

Quaternary catchment A22H is drained by the Hex River and its numerous tributaries, rising in the Magaliesberg Mountain and flowing towards the northeast. The Bospoort Dam is the only large dam occurring within the quaternary catchment and is situated where the Hex River exits the catchment. The Hex River, a tributary of the Olifants River, represents the main drainage channel in the catchment, into which numerous streams discharge. The Hex River discharges into the Bospoort Dam just before it exits the quaternary catchment.

The quaternary catchment in which the study area is located is significantly altered from its natural state as a result of historical and current anthropological activities within the area. These activities include extensive mining, irrigated agriculture and industrial activities.

Biodiversity

Ecological Scan (Badenhorst, 2015)

According to the delineation provided by Dallas (2005), the Level 1 Ecoregion of the area is the central Bushveld ecoregion. Kleynhans et al. (2005), describes the bushveld ecoregion as consisting predominantly of plains with a low relief with Mixed Bushveld being the definitive vegetation type.

The study area is located within the Marikana Thornveld biome. According to Mucina & Rutherford (2006), this biome is regarded as threatened and only 55% of the natural area remains. This biome occurs on plains from the Rustenburg area in the west, through Marikana and Brits to the Pretoria area in the east. Open Vachellia karroo woodland, occurs in valleys and slightly undulating plains, as well as some lowland hills. Shrubs are denser along

drainage lines on termitaria and rocky outcrops or in other habitat protected from fire. Most agricultural development of this unit lies in the western regions towards Rustenburg, while in the east (near Pretoria) industrial development is the greater threat to land transformation. Erosion in the region is very low to moderate. Alien invasive plants occur localised in high densities, especially along drainage lines.

Vegetation on the study area is largely homogeneous and consists of a grass layer interspersed with shrubs of which Vachellia karroo is the dominant species. Bush encroachment by Vachellia karroo is evident as a result of grazing activities and past construction activities in the immediate vicinity.

Due to the severely degraded state of the study area only limited fauna are present on site. Of these, the majority is avifauna. No other mammals where observed on site except one domestic cat. No herpetofauna were observed.

No signs of wetlands occur on the study area, therefore the need for a wetland assessment was not deemed necessary. During a desktop study, the National Freshwater Ecosystem Priority Areas (NFEPA) GIS data was also utilised to verify this.

It is likely that the proposed development will not have a negative effect on the study area itself as the entire area has been disturbed by past and present mining and agricultural activities.

Air Quality

Air Quality Baseline Report (Nortje, 2015)

The following prominent communities have been identified as sensitive receptors of dust and it is expected that these communities may be affected by dust fallout and other air pollutants, resulting from the proposed development:

- The town of Kroondal;
- The far south-eastern extension of Rustenburg, especially the suburb of Cashan;
- Agricultural land users of surrounding areas (small scale subsistence farming);
- The workers of mines and industrial facilities in the area (although in a lesser sense since Health and Safety regulations are enforced here and workers are generally well protected).

The main source of air pollution is the existing chrome tailings dumps. It is expected that the TSF and WRD will have an impact on air quality within the high dust fallout area (i.e. 200m from the source). The results of the measurement of current dust fallout levels indicates that the levels are below the allowed limits. The amount of dust fallout expected outside this area is not significant. It is not expected that the air quality outside of the study will deviate from its current condition once the proposed activity becomes operational. Normal vehicular activity, as is already present, will most likely continue. There is, however, a risk that dust levels may increase as a result of the proposed activity and therefore mitigation measures will be recommended. Typical mitigation measures such

as a speed limit of 30km/h implemented will serve a triple purpose: Reduce dust fallout, reduce exhaust emissions and ensure the safety of workers. Another measure is to increase the current frequency of dust suppression by means of spraying water on surrounding roads.

Noise

Noise Baseline Report (Nortje, 2015)

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 proposed development 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 amount of vehicles moving around the site.

Noise generation can therefore be expected on the proposed 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 proposed 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.

Visual Aspects

Visual Impact Assessment (Nortje, 2015)

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 sub-region 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 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.

Sites of Archaeological Significance

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).

Socio-Economic Environment

Population growth

According to the North West Province Provincial Development Plan, 2014, the population of the North West Province is estimated at 3.5 million individuals and should increase to approximately 3.9 to 4 million people by 2030. The population currently exists of 1.06 million households with an average of 3.3 people each. The youth make up the majority of the population with more than 60 % under the age of 34 years.

The population of the Bojanala Platinum District Municipality (Source: Draft Review IDP Bojanala Platinum District Municipality, 2018/2019) is estimated to be 1 670 000. The population of the Rustenburg Local Municipality is estimated to be 631 000 in 2016. The Rustenburg Local Municipality have an annual growth of 1.80 %, implying the projected population of the local municipality to be 690 000 in 2020. It is clear that the population is steadily growing and this is mainly due to the mining activities in the area (Rustenburg IDP Final Report 2018/2019).

Gender and Age Distribution

The Bojanala Platinum District Municipality (BPDM) has a typical age structure of a very young population distribution. The largest share of population is within the young working age (25-44 years) age category with a total number of 608 000 or 36.4% of the total population. By comparing the population pyramid of the Bojanala Platinum District Municipality with the national age structure, the most significant differences are:

- There is a significantly larger share of young working age people - aged 20 to 34 (30.7%) - in Bojanala Platinum, compared to the national picture (28.6%).
- The area appears to be a migrant receiving area, with many of people migrating into Bojanala Platinum, either from abroad, or from the more rural areas in the country looking for better opportunities.
- Spatial policies changed since 1994.

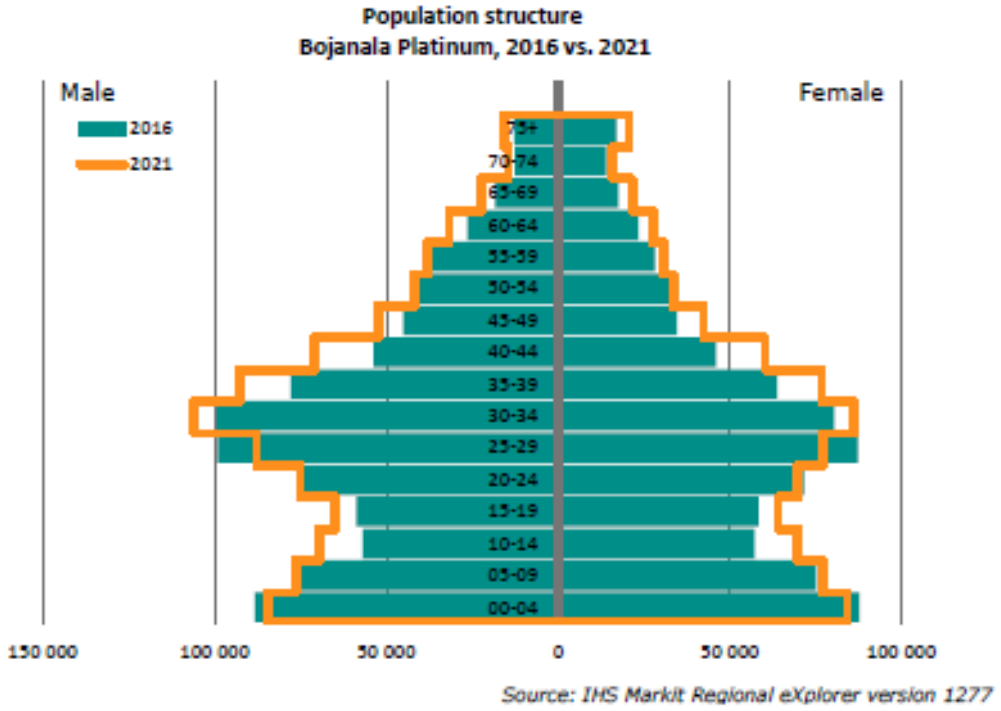


Figure 9: Gender and Age Distribution in BPDM in 2016 vs 2021 (Source: BPDM IDP 2017/2018)

The figure below indicates the population distribution with regards to age within the Rustenburg Local Municipality (RLM) in 2016. The largest share of the population was between 20 and 44 years of age, which is the age group representing the majority of the workforce (258 000 or 40.8 % of the total population). The area appears to be a migrant receiving area, with many people migrating into Rustenburg, either from abroad, or from the more rural areas in the country looking for better opportunities.

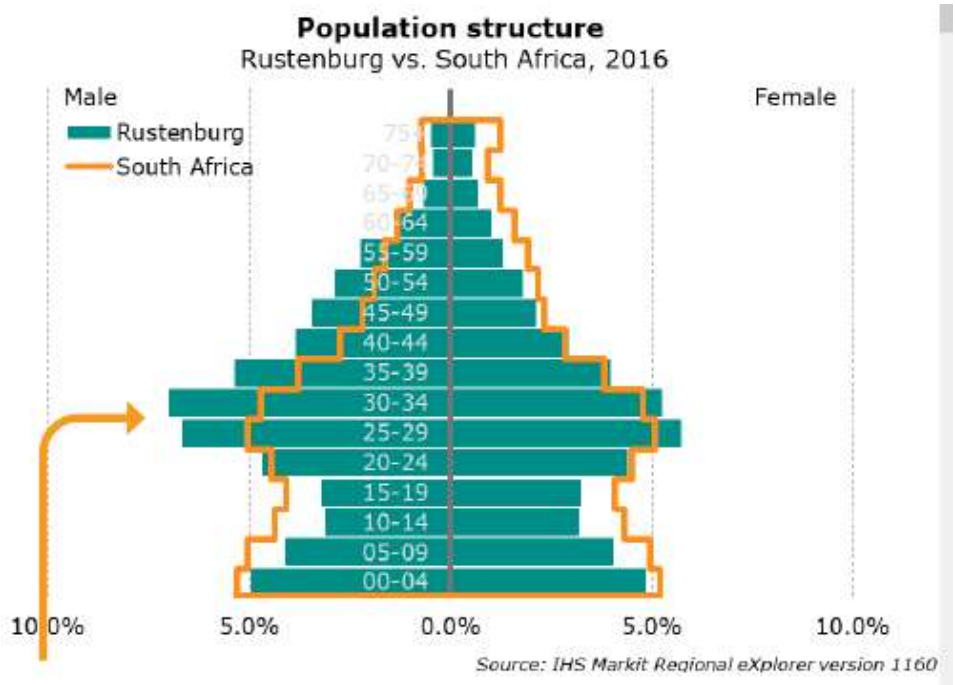


Figure 10: Gender and Age Distribution for Rustenburg Local Municipality (Source: RLM IDP 2017/2018

Education Levels

From Figure 11 below it can be seen that a very low percentage of the population of the RLM have higher education qualifications and only 8.9% holds post graduate qualifications. 31 % of those aged 20 years and older have matric.

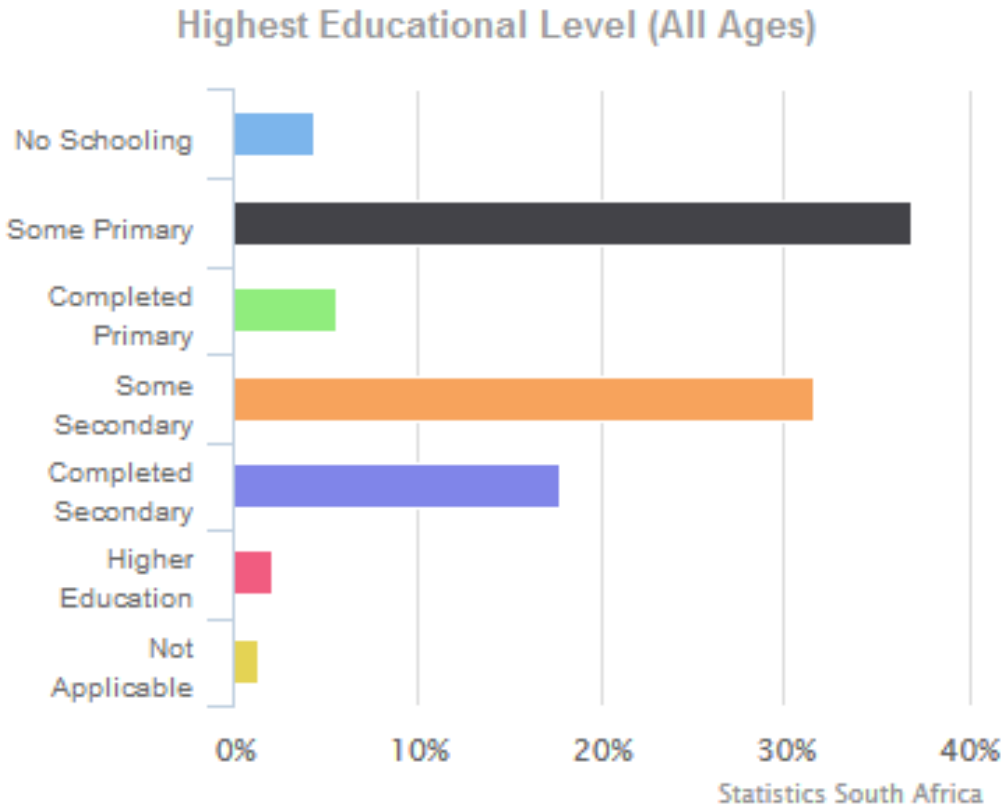
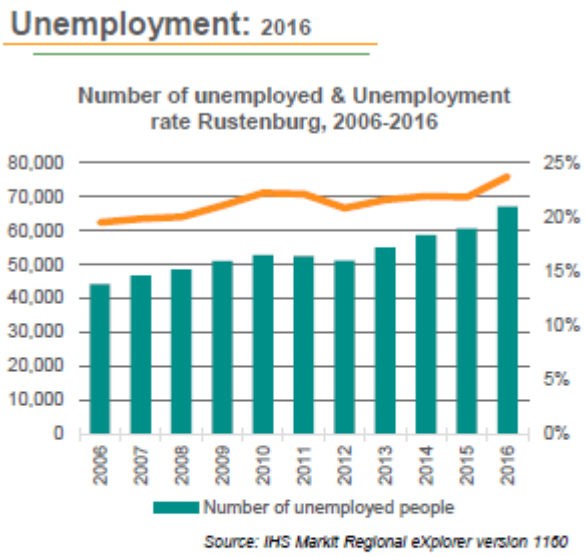


Figure 11: Highest Level of Education Age (all ages) in RLM (Source: Census SA, 2011)

Employment Status

Both the BPDM and the RLM is characterised by high levels of unemployment. The overall unemployment rate for the RLM is 34.70 % of the 142 219 economically active youth (ages between 15 and 34) (Census SA, 2011)

Figure 12 below indicates that unemployment has increased from 2006 to 2016. This largely corresponds with the national labour force participation rate during the same period.



Unemployment Rate 2006 vs 2016

	2006	2016
Rustenburg	19.5%	23.7%
National Total	25.8%	26.3%

Figure 12: Economically active population between 2006 and 2016 (Source: RLM IDP 2017/2018)

From Figure 13 it is clear that of the formal employment sector, approximately 34.7% of the workforce within the RLM are employed in the mining sector (75 400 individuals), followed by trade (34 000). Apart from the mining sector, the municipality is quite diversified in terms of work sectors.

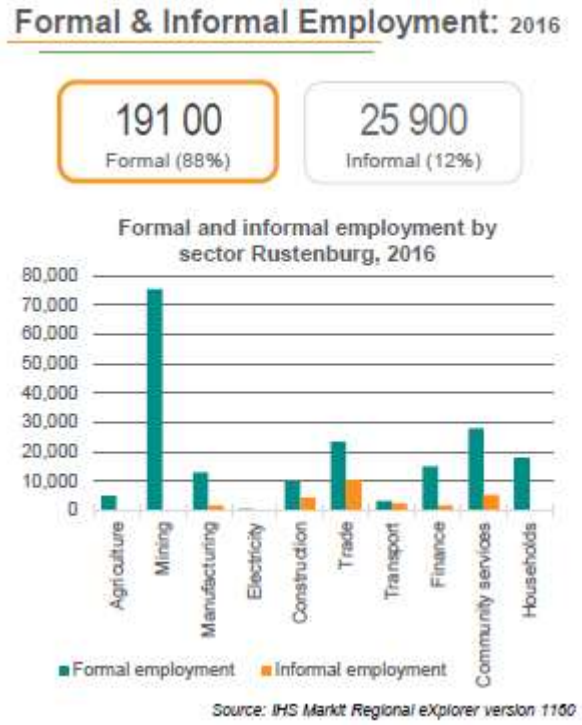


Figure 13: Formal Employment by SIC Sectors (Source: RLM IDP, 2017/2018)

(b) Description of specific environmental features and infrastructure on the site

A brick manufacturing plant is located on the northern section of the Samancor Millsell Waste Rock Dump are, where the Community Waste Rock Beneficiation Facility is proposed. The brick manufacturing plant will be removed. The surrounding land uses include cultivated land, small holdings and the mining activities at the Millsell mine section. The following figures show views of the site from various directions. In addition, Agricultural practices and current/historical mining impact on the area. The adjacent Waterkloof mine section and various other chrome and platinum mines are currently active and mining is taking place via underground and opencast methods in the vicinity of the Millsell mine section. Agriculture in the form of grazing and monoculture crops are also prominent within the study area as well as numerous informal settlements.

Figure 14: Mining infrastructure toward the north of the site from its centre

Figure 15: The existing WRD to the north east of the site from its centre

Figure 16: WRD and haul road to the east of the site from the site centre

Figure 17: WRD and haul road to the south east of the site from the site centre

Figure 18: WRD to the south of the site with TSF behind WRD from the centre

Figure 19: WRD to the south west of the site

Figure 20: Mine infrastructure to the west of the site from the centre

Figure 21: Mine infrastructure and agriculture to the north west of the site

From the description of the baseline environment above, it is clear that no significant sensitive environmental features occur on the study area. Vegetation on the study area is largely homogeneous and consists of a grass layer interspersed with shrubs of which *Vachellia karroo* is the dominant species. Due to the severely degraded state of the study area only limited fauna are present on site. Of these, the majority is avifauna. No other mammals where observed on site except one domestic cat. No herpetofauna were observed. No signs of wetlands occur on the study area.

Existing Infrastructure on the study area and in close proximity

Roads

The N4 Highway runs approximately 300m to the south of the site. A surfaced district road i.e. Arnoldistad road, are slightly elevated to the N4 Highway and is located between 30 and 150m to the south-east. The R104 provincial road runs immediately north of the site from the north-west towards the south-east. There is an access road to the homestead south of the site and runs along the current western mine boundary.

Railway line

No railway lines occur in close proximity to the study area, however there is a railway line running from west to east approximately 5km north of the study area. The closest stations are Tabak and Colombia.

Powerlines

There is a power substation at the Millsell Mine with powerlines distributing electricity to the site.

Water

Most of the water needs are catered for by excess water pumped from the underground mine workings.

Other mining infrastructure at the Millsell mine include:

- Conveyor belts;
- Explosives magazine;
- Incline shafts and vents;
- Telephone lines;
- Pipelines;
- Mine Residual disposal sites including:
    - Tailings Dams being reclaimed; and
    - Waste Rock Dump;
- Mineral processing plant;
- Salvage Yard;
- Scrap yard;
- New filtration plant;
- Stockpile areas (chrome dumps, chip dump and concentrate);
- Topsoil stockpiles;
- Underground mining section;
- Water control system including trenches, other dams and pipelines;

- Water pollution management facilities including:
    - Stormwater drains and dams;
    - Sewage plant;
    - Pollution control dams, paddocks and evaporation dams; and
    - Process water supply system.
- Administration and other buildings:
    - Offices;
    - Hostel (buildings and soccer field);
    - Workshops; and
    - Paint and oil stores.

Other infrastructure in close proximity to the study area:

- The Samancor Waterkloof Mine is located approximately 2km north-east of the study area;
- Waterkloof community immediately north-west of the Waterkloof mine;
- The town of Kroondal with shops, offices, churches, schools and dwellings are located immediately to the east-south-east of the study area; and
- Agricultural holdings to the north, north-west, west, south-west and south of the study area.

(c) Environmental and current land use map

(Show all environmental, and current land use features)

Refer to Appendix 6

v) Impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts

(Provide a list of the potential impacts identified of the activities described in the initial site layout that will be undertaken, as informed by both the typical known impacts of such activities, and as informed by the consultations with affected parties together with the significance, probability, and duration of the impacts. Please indicate the extent to which they can be reversed, the extent to which they may cause irreplaceable loss of resources, and can be avoided, managed or mitigated).

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

- Views of I&APs;
- Existing information;
- Specialist investigations;
- Site visit with the project team; and

- Legislation.

The following potential major direct, indirect and cumulative impacts were identified:

- Contamination and compaction of soils;
- Erosion;
- Altered landforms;
- Limited loss of agricultural potential and land capability;
- Contamination of ground- and surface water quality and decline in quantity;
- Impacts on biodiversity;
- Loss and displacement of fauna;
- Impacts on existing land use of the study and surrounding area;
- Destruction or loss of heritage features including graves and other historical sites of importance that may be uncovered during excavations;
- Decreased aesthetic value and impact on "Sense of Place";
- Poor air quality and decreased visibility due to dust pollution;
- Increased noise levels;
- Waste generation;
- Increased demand on service infrastructure and resources;
- Slight increase in traffic and need for maintenance of road infrastructure;
- Potential injury and loss of health and life of humans; and
- Altered Socio-Economic Environment (Positive or negative).

Please refer to the designs report and drawings attached in Appendix 3 for the general layout plans.

(d) Environmental and current land use map

(Show all environmental, and current land use features).
Refer to Appendix 6

v) Impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts

(Provide a list of the potential impacts identified of the activities described in the initial site layout that will be undertaken, as informed by both the typical known impacts of such activities, and as informed by the consultations with affected parties together with the significance, probability, and duration of the impacts. Please indicate the extent to which they can be reversed, the extent to which they may cause irreplaceable loss of resources, and can be avoided, managed or mitigated).

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

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

The following potential major direct, indirect and cumulative impacts were identified:

- Contamination and compaction of soils;
- Erosion;
- Altered landforms;
- Limited loss of agricultural potential and land capability;
- Contamination of ground- and surface water quality;
- Impacts on biodiversity;
- Loss and displacement of fauna;
- Impacts on existing land use of the study and surrounding area;
- Destruction or loss of heritage features including graves and other historical sites of importance that may be uncovered during excavations;
- Decreased aesthetic value and impact on “Sense of Place”;
- Poor air quality and decreased visibility due to dust pollution;
- Increased noise levels;
- Waste generation;
- Increased demand on service infrastructure and resources;
- Potential injury and loss of health and life of humans; and
- Altered Socio-Economic Environment (Positive or negative).

Please refer to Table 12, Table 13 and Table 14, for the complete list of identified impacts and impact assessment. Please refer to the following section for the methodology used in the impact assessment.

Table 12: Impact Significance Calculation – Construction Phase

ENVIRONMENTAL ASPECT	NATURE OF THE IMPACT	IMPACT STATUS	MAGNITUDE	EXTENT	DURATION	REVERSIBILITY	IRREPLACEABILITY	PROBABILITY	SIGNIFICANCE PRE-MITIGATION	MITIGATION POTENTIAL	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION	CONFIDENCE RATING	CUMULATIVE IMPACTS
GEOLOGY AND SOILS	Loss of topsoil	–	2	1	4	2	10	5	50	High	Please refer to Table 19	17	Certain	Low
	Contamination of soils through: • Indiscriminate disposal of construction waste; and • Accidental spillage of chemicals such as hydrocarbon-based fuels and oils or lubricants spilled from construction vehicles and other chemicals from construction activities e.g. paints.	–	3	2	1	1	7	2	14	High	Please refer to Table 19	5	Sure	Low
	Vehicle and personnel as well as storage of materials, equipment and stockpiling compaction and degradation impacts.	–	3	2	1	1	7	5	35	Medium	Please refer to Table 19	18	Sure	Medium
HYDROLOGY GROUNDWATER SURFACE WATER	Stormwater, erosion and siltation impacts due to a lack of implementing temporary measures to manage stormwater run-off quantity and quality during the construction phase.	–	4	2	1	2	9	2	18	High	Please refer to Table 19	8	Sure	Medium
	Contamination of stormwater runoff and ground water, caused by: - Spills and leaks of cement; - Chemicals such as hydrocarbon-based fuels and oils or lubricants spilled from construction vehicles; and - Other chemicals from construction activities e.g. paints.	–	4	3	2	2	11	2	22	Medium	Please refer to Table 19	11	Sure	Medium
	Altered drainage patterns and stormwater runoff flows.	–	4	3	1	2	10	1	10	Medium	Please refer to Table 19	5	Sure	Medium
	The runoff from the plant area following rainfall may be contaminated due to the activities and may contaminate surface water.	–	3	3	4	1	11	2	22	High	Please refer to Table 19	7	Certain	Low
BIOLOGICAL FAUNA AND FLORA	Potential decrease in significant biodiversity on the study and surrounding area.	–	1	1	1	5	8	1	9	Low	Please refer to Table 19	6	Sure	Medium
	Spreading of alien invasive species and bush encroachment of indigenous species.	–	2	2	1	1	6	3	18	High	Please refer to Table 19	6	Certain	Medium
	Impact on natural migratory routes and faunal dispersal patterns.	–	4	1	5	3	13	1	13	Low	Please refer to Table 19	9	Certain	Medium
	Disturbance and loss of fauna through noise, light and dust pollution and hunting, trapping and killing of fauna.	–	4	2	1	1	8	4	32	Low	Please refer to Table 19	21	Sure	Medium

ENVIRONMENTAL ASPECT	NATURE OF THE IMPACT	IMPACT STATUS	MAGNITUDE	EXTENT	DURATION	REVERSIBILITY	IRREPLACEABILITY	PROBABILITY	SIGNIFICANCE PRE-MITIGATION	MITIGATION POTENTIAL	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION	CONFIDENCE RATING	CUMULATIVE IMPACTS
	Potential loss of vegetation type, ecologically important species and species of conservation concern.	_	2	1	5	5	13	1	13	Low	Please refer to Table 19	9	Certain	Medium
EXISTING LAND USE	Loss of land for other purposes e.g. cultivation.	_	3	1	1	1	6	5	30	Low	Please refer to Table 19	20	Certain	Low
ARCHAEOLOGICAL/ HERITAGE RESOURCES	Alteration of archaeological, historical and palaeontological resources that may be discovered during earthworks.	_	1	1	5	5	12	1	12	Low	Please refer to Table 19	8	Certain	Low
VISUAL	Visibility from sensitive receptors / visual scarring of the landscape as a result of the construction activities.	_	3	3	1	1	8	5	40	Low	Please refer to Table 19	27	Certan	Medium
NOISE 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 construction vehicles and equipment.	–	3	3	1	1	8	5	40	Medium	Please refer to Table 19	20	Certain	Low
	Added impact of security lighting on surrounding landowners and nocturnal animals.	_	3	3	1	2	9	2	18	Medium	Please refer to Table 19	9	Sure	Low
AIR QUALITY	Increased dust pollution due to vegetation clearance and construction vehicles and activities.	_	4	2	1	1	8	5	40	High	Please refer to Table 19	13	Sure	Medium
	Windborne dust (soil) and vehicle fumes and particulate matter PM10, altering air quality.	_	3	3	1	1	8	5	40	High	Please refer to Table 19	13	Sure	Medium
WASTE	Generation of additional general waste, litter and building rubble and hazardous material during the construction phase.	_	3	2	1	1	7	5	35	High	Please refer to Table 19	12	Certain	Low
SERVICES	Need for services i.e. water, electricity and sewerage systems during the construction phase causing additional strain on natural resources and service infrastructure.	_	2	3	1	1	7	1	7	High	Please refer to Table 19	2	Certain	Medium
TRAFFIC	The change in traffic patterns as a result of traffic entering and exiting the site on the surrounding road infrastructure and existing traffic.	_	2	3	1	1	7	2	14	Medium	Please refer to Table 19	7	Sure	Medium
	Nuisance, health and safety risks caused by increased traffic on and adjacent to the study area including cars, busses and other heavy vehicles.	_	3	3	1	1	8	2	16	Medium	Please refer to Table 19	8	Sure	Low
HEALTH AND SAFETY	Possibility of construction activities and workers causing veld fires, which can potentially cause injury and or loss of life to construction workers and surrounding landowners, visitors and workers.	–	5	4	5	5	19	2	38	Medium	Please refer to Table 19	19	Sure	Medium
	Increased risk to public and worker safety: If not fenced off, the public and workers may fall into excavated areas and trenches.	_	4	3	5	5	17	2	34	Medium	Please refer to Table 19	17	Sure	Low

ENVIRONMENTAL ASPECT	NATURE OF THE IMPACT	IMPACT STATUS	MAGNITUDE	EXTENT	DURATION	REVERSIBILITY	IRREPLACEABILITY	PROBABILITY	SIGNIFICANCE PRE-MITIGATION	MITIGATION POTENTIAL	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION	CONFIDENCE RATING	CUMULATIVE IMPACTS
SOCIO-ECONOMIC	Positive: Potential creation of short term employment opportunities for the local communities, during the construction phase.	**+**	**3**	**3**	**1**	**1**	**8**	**5**	**40**	**N/A**	Please refer to Table 19	**40**	**Certain**	**Low**

Table 13: Impact Significance Calculation – Operational Phase

ENVIRONMENTAL ASPECT	NATURE OF THE IMPACT	IMPACT STATUS	MAGNITUDE	EXTENT	DURATION	REVERSIBILITY	IRREPLACEABILITY	PROBABILITY	SIGNIFICANCE PRE-MITIGATION	MITIGATION POTENTIAL	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION	CONFIDENCE RATING	CUMULATIVE IMPACTS
GEOLOGY AND SOILS	Soil erosion and soil compaction by heavy duty vehicles on site.	–	3	2	4	1	10	5	50	Medium	Please refer to Table 19	25	Sure	Medium
	Contamination of soils through: - 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.	–	3	2	4	1	10	5	50	High	Please refer to Table 19	25	Sure	Low
HYDROLOGY GROUNDWATER SURFACE WATER	Stormwater, erosion and siltation impacts due to a lack of implementing measures to manage stormwater run-off quantity and quality during the operational phase.	–	3	4	4	3	14	3	42	High	Please refer to Table 19	14	Sure	Medium
	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.	–	3	3	4	3	13	3	39	High	Please refer to Table 19	13	Sure	Low
	Groundwater contamination from storage of operational materials and hydrocarbons.	–	3	3	4	3	13	2	26	Medium	Please refer to Table 19	13	Sure	Low
	Surface water contamination from residue stockpiles.	–	3	3	4	2	12	3	36	Medium	Please refer to Table 19	18	Sure	Low
	The runoff from the plant area following rainfall may be contaminated due to the stockpiling, crushing and screening activities and may contaminate surface water.	–	4	3	4	3	14	3	42	High	Please refer to Table 19	14	Sure	Low
BIOLOGICAL FAUNA AND FLORA	Disturbance and loss of fauna through noise, light and dust pollution and hunting, trapping and killing of fauna.	–	3	2	4	1	10	2	20	Medium	Please refer to Table 19	10	Sure	Low
	Spreading of alien invasive species and bush encroachment of indigenous species.	–	3	2	4	1	10	4	40	High	Please refer to Table 19	13	Sure	Medium
EXISTING LAND USE	Possibility of mining activities and workers causing veld fires destroying veld and animals on the study	–	5	3	5	5	18	2	36	Medium	Please refer to Table 19	18	Sure	Medium

ENVIRONMENTAL ASPECT	NATURE OF THE IMPACT	IMPACT STATUS	MAGNITUDE	EXTENT	DURATION	REVERSIBILITY	IRREPLACEABILITY	PROBABILITY	SIGNIFICANCE PRE-MITIGATION	MITIGATION POTENTIAL	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION	CONFIDENCE RATING	CUMULATIVE IMPACTS
	area and on adjacent land, impacting on the livelihood of surrounding land owners and users.													
ARCHAEOLOGICAL/ HERITAGE RESOURCES	Alteration of archaeological, historical and palaeontological resources that may be discovered during earthworks.	–	**2**	**1**	**5**	**5**	**13**	**1**	**13**	**Low**	Please refer to Table 19	**9**	**Sure**	**Low**
VISUAL	Visibility from sensitive receptors / visual scarring of the landscape and impact on 'Sense of Place' as a result of the visibility of the site including the waste management facilities and mining activities.	–	**3**	**3**	**4**	**4**	**14**	**5**	**70**	**Low**	Please refer to Table 19	**47**	**Sure**	**Medium**
	Visibility of solid domestic and operational waste.	–	**2**	**2**	**4**	**1**	**9**	**5**	**45**	**Medium**	Please refer to Table 19	**23**	**Sure**	**Medium**
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 waste management activities and processing.	–	**4**	**3**	**4**	**1**	**12**	**5**	**60**	**Medium**	Please refer to Table 19	**30**	**Sure**	**Low**
	Disturbance due to vibrations caused by vehicles.	–	**3**	**2**	**4**	**1**	**10**	**5**	**50**	**Medium**	Please refer to Table 19	**25**	**Sure**	**Low**
	Impact of security lighting on surrounding landowners and animals.	–	**3**	**2**	**4**	**2**	**9**	**4**	**36**	**Medium**	Please refer to Table 19	**18**	**Sure**	**Low**
AIR QUALITY	Increased dust pollution (soil and ore fines), vehicles on gravel roads and storage of tailings and waste rock, as well as other re-mining activities.	–	**4**	**3**	**4**	**1**	**12**	**5**	**60**	**High**	Please refer to Table 19	**20**	**Sure**	**Medium**
	Increased windborne dust (soil and ore fines), vehicle fumes and particulate matter PM10, altering air quality.	–	**2**	**3**	**4**	**2**	**11**	**5**	**55**	**High**	Please refer to Table 19	**18**	**Sure**	**Medium**
WASTE	Generation and disposal of additional general waste, litter and hazardous material during the operational phase and operational waste of the mine i.e. waste rock, tailings etc.	–	**2**	**3**	**4**	**1**	**10**	**5**	**50**	**High**	Please refer to Table 19	**17**	**Certain**	**Low**
SERVICES	Need for services e.g. water, electricity and sewerage systems, causing additional strain on natural resources and service infrastructure.	–	**2**	**3**	**4**	**1**	**10**	**2**	**20**	**Medium**	Please refer to Table 19	**10**	**Certain**	**Medium**
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.	–	**3**	**3**	**4**	**1**	**11**	**4**	**44**	**Medium**	Please refer to Table 19	**22**	**Sure**	**Medium**
	Nuisance, health and safety risks caused by increased traffic on an adjacent to the study area including cars and heavy vehicles.	–	**4**	**3**	**4**	**1**	**12**	**5**	**60**	**Medium**	Please refer to Table 19	**30**	**Sure**	**Low**

ENVIRONMENTAL ASPECT	NATURE OF THE IMPACT	IMPACT STATUS	MAGNITUDE	EXTENT	DURATION	REVERSIBILITY	IRREPLACEABILITY	PROBABILITY	SIGNIFICANCE PRE-MITIGATION	MITIGATION POTENTIAL	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION	CONFIDENCE RATING	CUMULATIVE IMPACTS
HEALTH AND SAFETY	Possibility of activities and workers causing veld fires, which can potentially cause injury and or loss of life to workers and surrounding landowners, visitors and workers.	–	5	4	5	5	19	2	38	Medium	Please refer to Table 19	19	Sure	Medium
	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 workers and visitors to the site.	–	4	2	5	5	16	2	32	Medium	Please refer to Table 19	16	Sure	Low
SOCIO-ECONOMIC	Socio-economic impact on farmers, labourers and surrounding landowners and residents due to negative impacts on groundwater, dust pollution, noise pollution etc.	–	4	3	4	3	14	5	70	Medium	Please refer to Table 19	35	Sure	Medium
	Economic impact should there be an incident of public health and safety.	–	3	3	3	1	10	2	20	High	Please refer to Table 19	7	Sure	Medium
	Positive: Extended employment provision due to the implementation of the waste management activities, allowing activities and beneficiation of waste rock to continue for additional years.	+	4	4	4	1	13	5	65	N/A	Please refer to Table 19	65	Certain	Low
	Positive: Sourcing supplies from local residents and businesses boosting the local economy for an extended period of time.	+	3	4	4	1	12	5	60	N/A	Please refer to Table 19	60	Certain	Low

Table 14: Impacts during the closure phase

ENVIRONMENTAL ASPECT	NATURE OF THE IMPACT	IMPACT STATUS	MAGNITUDE	EXTENT	DURATION	REVERSIBILITY	IRREPLACEABILITY	PROBABILITY	SIGNIFICANCE PRE-MITIGATION	MITIGATION POTENTIAL	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION	CONFIDENCE RATING	CUMULATIVE IMPACTS
GEOLOGY AND SOILS	Soil compaction by heavy duty vehicles on site.	–	3	2	2	1	8	5	40	Medium	Please refer to Table 19	20	Sure	Low
	Contamination of soils through: - Indiscriminate disposal of waste; and - Accidental spillage of chemicals such as hydrocarbon-based fuels and oils or lubricants spilled from vehicles.	–	3	2	2	2	9	4	36	High	Please refer to Table 19	12	Sure	Low
HYDROLOGY GROUNDWATER SURFACE WATER	Stormwater, erosion and siltation impacts due to a lack of implementing measures to manage stormwater run-off quantity and quality during the closure phase.	–	4	3	2	2	11	3	33	High	Please refer to Table 19	11	Sure	Medium
	Contamination of stormwater runoff and groundwater, caused by: - Sediment release; - Chemicals such as hydrocarbon-based fuels and oils or lubricants spilled from heavy duty vehicles; - Effluent discharges, due to a lack of stormwater management.	–	4	3	2	3	12	2	24	Medium	Please refer to Table 19	12	Sure	Medium
	Seepage from waste management facilities could cause a contamination plume affecting the underground water resources.	–	4	4	4	3	15	2	30	Medium	Please refer to Table 19	15	Sure	Low
BIOLOGICAL FAUNA AND FLORA	Disturbance and loss of fauna through noise, light and dust pollution as well as hunting, trapping and killing of fauna.	–	4	3	2	1	10	2	20	Medium	Please refer to Table 19	10	Sure	Low
	Spreading of alien invasive species and bush encroachment of indigenous species.	–	3	2	2	1	8	3	24	High	Please refer to Table 19	8	Sure	Medium
VISUAL	Visibility from sensitive receptors / visual scarring of the landscape as a result of the closure and rehabilitation activities.	–	3	3	2	1	9	5	45	Low	Please refer to Table 19	30	Sure	Medium
	Visibility of solid domestic and operational waste.	–	2	2	2	1	7	5	35	Medium	Please refer to Table 19	18	Sure	Medium
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.	–	3	3	2	3	11	2	22	Medium	Please refer to Table 19	10	Sure	Low
	Disturbance due to vibrations caused by heavy duty vehicles.	–	3	3	2	1	9	4	36	Medium	Please refer to Table 19	18	Sure	Low
	Impact of security lighting on surrounding landowners and animals.	–	3	2	2	2	9	4	36	Medium	Please refer to Table 19	18	Sure	Low

ENVIRONMENTAL ASPECT	NATURE OF THE IMPACT	IMPACT STATUS	MAGNITUDE	EXTENT	DURATION	REVERSIBILITY	IRREPLACEABILITY	PROBABILITY	SIGNIFICANCE PRE-MITIGATION	MITIGATION POTENTIAL	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION	CONFIDENCE RATING	CUMULATIVE IMPACTS
AIR QUALITY	Dust (soil and ore fines) pollution due to rehabilitation activities and heavy duty vehicles.	–	4	3	2	1	10	5	50	High	Please refer to Table 19	17	Sure	Medium
	Windborne dust (soil and ore fines) and vehicle fumes and particulate matter PM10, altering air quality.	–	3	3	2	1	9	5	45	High	Please refer to Table 19	15	Sure	Medium
WASTE	The activity in itself is associated with the mining activities that it will serve and therefore it will serve to contribute to the spread of waste from mining activities (however small or large the scale).	–	3	3	5	3	14	5	70	Medium	Please refer to Table 19	35	Sure	Low
SERVICES	Need for additional services i.e. water, electricity and sewerage systems during the closure phase causing additional strain on natural resources and infrastructure.	–	2	3	2	1	8	5	40	Medium	Please refer to Table 19	20	Certain	Medium
TRAFFIC	The change in the traffic patterns as a result of traffic entering and exiting the proposed mine on the surrounding road infrastructure and existing traffic.	–	3	3	2	1	9	3	27	Medium	Please refer to Table 19	14	Sure	Medium
	Nuisance, health and safety risks caused by increased traffic on an adjacent to the study area including cars and heavy vehicles.	–	3	3	2	1	9	2	18	Medium	Please refer to Table 19	9	Sure	Low
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.	–	5	4	5	5	19	2	38	Medium	Please refer to Table 19	19	Sure	Medium
	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.	–	4	3	5	5	17	2	34	Medium	Please refer to Table 19	17	Sure	Low
	Increased risk to public and worker health and safety.	–	4	3	5	5	17	2	34	Medium	Please refer to Table 19	17	Sure	Low
SOCIO-ECONOMIC	Socio-economic impact on farmers, labourers and surrounding landowners and residents due to negative impacts on groundwater, dust pollution, noise pollution etc.	–	4	4	4	3	15	3	45	Medium	Please refer to Table 19	23	Sure	Medium
	Economic impact should there be an incident of public health and safety.	–	3	3	3	3	12	2	24	High	Please refer to Table 19	8	Sure	Low
	Positive: Sourcing supplies from local residents and businesses boosting the local economy for an extended period of time.	+	3	3	2	1	9	5	45	N/A	Please refer to Table 19	45	Certain	Low

Table 15: Impacts as a result of not implementing the proposed development

ENVIRONMENTAL ASPECT	NATURE OF THE IMPACT	IMPACT STATUS	MAGNITUDE	EXTENT	DURATION	REVERSIBILITY	IRREPLACEABILITY	PROBABILITY	SIGNIFICANCE PRE-MITIGATION	MITIGATION POTENTIAL	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION	CONFIDENCE RATING	CUMULATIVE IMPACTS
SOCIO-ECONOMIC	Reduced period of providing employment for local residents and skills transfer to unskilled and semi-skilled unemployed individuals.	–	4	3	4	1	12	5	60	High	Please refer to Table 19	20	Certain	Medium
	Reduced period of development and upliftment of the surrounding communities and infrastructure.	–	3	3	4	1	11	5	55	High	Please refer to Table 19	18	Certain	Medium
	Reduced period of development of the economic environment, by job provision and sourcing supplies for and from local residents and businesses.	–	3	3	4	1	11	5	55	High	Please refer to Table 19	18	Certain	Medium
GENERAL	Positive: No additional negative impacts on the environment.	+	3	3	4	3	13	5	65	N/A	Please refer to Table 19	65	Sure	Medium

vi) Methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks;

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

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

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

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

The Environmental Impact Assessment (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.

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

ENVASS Impact Assessment Methodology

By considering the root cause of the issue in this way, the probability that the activity undertaken does or may result in an impact, can be determined. The associated impact can then be assessed in order to determine its significance and to define mitigation measures or management measures to address the impact.

The following definitions therefore apply:

- An activity is a distinct process or task undertaken by an organisation for which a responsibility can be assigned. Activities also include facilities or pieces of infrastructure that are possessed by an organisation;
- An environmental aspect is an 'element of an organisation's activities, products and services which can interact with the environment. The interaction of an aspect with the environment may result in an impact;
- Environmental impacts are the consequences of these aspects on environmental resources or receptors of particular value or sensitivity, for example, disturbance due to noise and health effects due to poorer air quality;
- Receptors can comprise, but are not limited to, people or human-made systems, such as local residents, communities and social infrastructure, as well as components of the biophysical environment such as aquifers, flora and palaeontology. Impacts on the environment can lead to changes in existing conditions; the impacts can be direct, indirect or cumulative;
- Direct impacts refer to changes in environmental components that result from direct cause-effect consequences of interactions between the environment and project activities. Indirect impacts result from cause-effect consequences of interactions between the environment and direct impacts; and
- Cumulative impacts refer to the accumulation of changes to the environment caused by human activities.

Assessment of Impact Significance

The accumulated knowledge and the findings of the environmental investigations form the basis for the prediction of impacts. Once a potential impact has been determined, it is necessary to identify which project activity will cause the impact, the probability of occurrence of the impact, and its magnitude and extent (spatial and temporal). This information is important for evaluating the significance of the impact, and for defining mitigation and monitoring strategies. The aspects and impacts identified are therefore described according to the following:

(a) Nature of the impact

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

(b) The status of the impact:

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

(c) Magnitude of the impact

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

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

(d) Extent of the impact

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

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

(e) Duration of the impact

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

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

(f) Degree to which impact can be reversed

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

Determining the reversibility of an impact			
REVERSIBILITY	**Reversibility**	**Score**	**Description**
	Completely reversible	**1**	**Impacts can be reversed through the implementation of minimal mitigation measures and rehabilitation with negligible residual effects.**
	Nearly completely reversible	**2**	**Impacts can nearly be completely reversed through the implementation of mitigation measures and rehabilitation, with marginal residual effects.**
	Partly reversible	**3**	**Impacts can be partly reversed through the implementation of mitigation measures and rehabilitation with moderate residual effects.**
	Nearly irreversible	**4**	**Impacts can be mitigated, but only marginally reversed through the implementation of mitigation measures and rehabilitation with severe residual effects.**
	Irreversible	**5**	**Impacts are permanent and can't be reversed by the implementation of mitigation measures or rehabilitation is not viable.**

(g) Degree to which impact may cause irreplaceable loss of resources

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

Irreplaceability = Magnitude + Extent + Duration + Reversibility

Degree to which impact may cause irreplaceable loss of resources			
IRREPLACEABILITY Irreplaceable loss of resources	**Irreplaceability**	**Score**	**Description**
	No loss	**0**	**No loss of any resources**
	Very Low	**1 - 5**	
	Low	**6 - 10**	**Marginal loss or resources**
	Medium	**11 - 15**	**Significant loss of resources**
	High	**16 - 20**	**Complete loss of resources**

(h) Probability of the impact occurring

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

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

(i) Significance of Impacts - Pre-Mitigation

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

The significance of an impact is determined as follows:

Significance = Irreplaceability x Probability

The maximum value is 100 significance points (SP). Environmental impacts were rated as either of Very High (VH) High (H), Medium (M), Low (L) or Very Low (VL) significance on the following basis:

Table 16: Significance Rating (SR) Basis

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

(j) Degree to which the impact can be mitigated

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

MITIGATION POTENTIAL	Determining the mitigation potential of an impact		
	Degree	Calculation	Description
	High	Pre-mitigation SR / 3 = Post Mitigation SR	Impact 100% mitigated
	Medium	Pre-mitigation SR / 2 = Post Mitigation SR	Impact >50% mitigated
	Low	Pre-mitigation SR / 3 = x Then: Pre-mitigation SR – x = Post Mitigation SR	Impact <50% mitigated

(k) Significance of Impacts Post-Mitigation

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

The significance of an impact is determined as follows:

Significance = Irreplaceability x Probability

Table 17: Significance Rating

Score	Significance
0	Neutral
1 to 20	Very low
21 to 40	Low
41 to 60	Medium

Score	Significance
61 to 80	High
81 to 100	Very high

(I) Confidence rating

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

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

(m) Cumulative impacts

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

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

vii) The positive and negative impacts that the proposed activity (in terms of the initial site layout) and alternatives will have on the environment and the community that may be affected.

(Provide a discussion in terms of advantages and disadvantages of the initial site layout compared to alternative layout options to accommodate concerns raised by affected parties)

At this stage, there are no layout alternatives.

The proposed location is located on an area already disturbed by mining / waste management activities. The probability of negative impacts additional to those currently evident on site are minimal, with the added positive impacts of socio-economic upliftment through job creation, training and mentoring of local residents. The proposed development of the Community Waste Rock Beneficiation Facility forms part of the Samancor Chrome Millsell mine Social and Labour Plan. The negative impacts of the proposed development location and layout are mitigated by the proposed location on an area already disturbed by mining / waste managent activities.

viii) The possible mitigation measures that could be applied and the level of risk.

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

TO BE COMPLETED ONCE PP PROCESS ENDS ON 14 NOVEMBER 2018.

Table 18: Mitigation measures

Source activities / processes	Environmental Impact:	Stakeholder comment	Mitigation Measures
TBD	TBD	TBD	TBD

ix) Motivation where no alternative sites were considered

At this stage, there are no location alternatives.

The proposed location is located on an area already disturbed by mining / waste management activities. The probability of negative impacts additional to those currently evident on site are minimal, with the added positive impacts of socio-economic upliftment through job creation, training and mentoring of local residents. The proposed development of the Community Waste Rock Beneficiation Facility forms part of the Samancor Chrome Millsell mine Social and Labour Plan. The negative impacts of the proposed development location and layout are mitigated by the proposed location on an area already disturbed by mining / waste managent activities.

x) Statement motivating the alternative development location within the overall site. (Provide a statement motivating the final site layout that is proposed)

The proposed location is located on an area already disturbed by mining / waste management activities. The probability of negative impacts additional to those currently evident on site are minimal, with the added positive impacts of socio-economic upliftment through job creation, training and mentoring of local residents. The proposed development of the Community Waste Rock Beneficiation Facility forms part of the Samancor Chrome Millsell mine Social and Labour Plan. The negative impacts of the proposed development location and layout are mitigated by the proposed location on an area already disturbed by mining / waste managent activities.

h) Full description of the process undertaken to identify, assess and rank the impacts and risks the activity will impose on the preferred site (In respect of the final site layout plan) through the life of the activity. *(Including (i) a description of all environmental issues and risks that were identified during the environmental impact assessment process and (ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures.)*

- **Approach to the EIA**

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

The EIA for this project complies with the National Environmental Management Act (1998) (as amended) and the NEMA EIA Regulations (2014) (as amended) and guidelines of the Department of Environmental Affairs (DEA). The guiding principles of an EIA are listed below.

- **Guiding principles for an EIA**

The EIA must take an open participatory approach throughout. This means that there should be no hidden agendas, no restrictions on the information collected during the process and an open-door policy by the proponent. Technical information must be communicated to stakeholders in a way that is understood by them and that enables them to meaningfully comment on the project.

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

- **Information gathering**

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

- **Specialist Assessments**

Specialist studies used for the application of the WML NW 30/5/1/2/3/2/1/ (236, 260 & 479) EM for the same property during 2015/2016 were utilized for the environmental impact assessment and environmental management programme:

- Archeological Impact Assessment (AIA);
- Ecological Scan (EcSc);
- Visual Impact Assessment (VIA);
- Air Quality Baseline Assessment (AIBA); and
- Noise Baseline Assessment (NBA).

The main objective of the specialist studies is to provide independent scientifically sound information on issues of concern relating to the project proposal.

The impacts identified by the various specialist studies undertaken, were incorporated into the EIA.

- **Legislative Framework**

The legal requirements were described and assessed in detail.

- **Alternatives**

Site alternatives and layouts have been assessed to determine the feasible socio-economical and biophysical option. However, due to the proposed location being owned by Samancor Chrome and the area being located on an area previously disturbed by waste management activities, no alternatives were found feasible.

- **Description and assessment of impacts identified**

A comprehensive list of all impacts as identified by the EAP and the specialists, are provided and are assessed.

- **Environmental management programme**

An Environmental Management Programme (EMPR) containing mitigation, management and monitoring measures and specifying roles and responsibilities was compiled with specialist input and are included in this report.

- **Stakeholder engagement**

Registered interested and affected parties including relevant organs of state, are consulted with during the process. All their comments will be formally responded to and incorporated into the final EIA within the BAR and EMPR that will be submitted to the competent authority.

h) Assessment of each identified potentially significant impact and risk

(This section of the report must consider all the known typical impacts of each of the activities (including those that could or should have been identified by knowledgeable persons) and not only those that were raised by registered interested and affected parties).

Table 19: Assessment of Impacts of Specific Activities

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE if not mitigated	MITIGATION TYPE	SIGNIFICANCE if mitigated
Construction Phase: Site preparation: Clearing of vegetation (if any) and excavation and backfilling of topsoil. Site preparation including the relocation of the access road involving clearing vegetation, excavation and backfilling. Boundary fence, preparation, flood light and borehole. Earthworks: Earthworks for the crushers, screens, conveyors, stockpile	Loss of topsoil	Soil	Construction	Medium (-)	**Prevent and reduce through management measures.** **Stripping of topsoil:** • Clearing areas for infrastructure construction to take place a maximum of one month prior to intended construction in the area; • Stripping of topsoil will not take place during rain or excessive wind; and • The top 30 cm of vegetation and topsoil is to be stripped from the area to be mined. **Storage of topsoil / overburden:** • Topsoil (top 30cm) is to be stored in predetermined topsoil berms, (+/- 5m) outside the boundary of the specific area; • The topsoil berm must not be located in any area demarcated for future mining; and • Topsoil stockpiles will be restricted to 1.5 to 2m in height. **Maintenance and monitoring of topsoil stockpiles:** • Monthly visual inspections to be conducted.	Very low (-)
	Contamination of soils	Soil	Construction	Very Low (-)	**Prevent and reduce and remedy through**	Very Low (-)

areas Installing stormwater management infrastructure	• Indiscriminate disposal of construction waste; and • Accidental spillage of chemicals such as hydrocarbon-based fuels and oils or lubricants spilled from construction vehicles and other chemicals from construction activities e.g. paints.				**management measures.** • All vehicles and machinery will be regularly serviced to ensure they are in proper working condition and to reduce risk of leaks; • All leaks will be cleaned up immediately using an absorbent material and spill kits, in the prescribed manner; and • The approved Integrated Water and Waste Management Plan (IWWMP) to be implemented. ***Hydrocarbons and hazardous waste*** • All hazardous waste generated shall be kept separate and shall not be mixed with general waste; and • All hazardous waste shall be stored within a sealed drum on an impermeable surfaced area within the central waste storage and transition area and disposed of by a registered waste service provider.	
	Soil compaction and degradation through vehicles driving and employees walking over open areas, as well as compaction through stockpiling.	Soil	Construction	Low (-)	**Prevent and reduce and remedy through management measures.** • Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants; and • Soils compacted, should be deeply ripped at least to a depth of 300mm to loosen compacted layers and re-graded to even running levels.	Very Low (-)
	Stormwater, erosion and siltation impacts due to inadequate stormwater management	Surface water	Construction	Very Low (-)	**Prevent and reduce and remedy through management measures.** • The Site Manager (SM) should ensure that excessive quantities of sand, silt and silt-laden water do not enter the stormwater system;	Very Low (-)

	measures				• Appropriate measures, e.g. construction of silt traps, or drainage retention areas to prevent silt and sand entering drainage or watercourses should be taken; • No wastewater may run freely into any of the surrounding naturally vegetated areas; • The loss of topsoil must be minimised; • Erosion and subsequent siltation must be limited; • Any drainage channels shall be suitably designed to ensure that erosion does not occur; • All areas susceptible to erosion shall be protected and stabilisation measures implemented: • Packing of sandbags, gabions, straw bales or brush to reduce the speed of water flow where water is scouring the topsoil and results in the formation of erosion gullies; • Any surface runoff generated which has a high suspended solid content shall be collected at the point source in an appropriate containment facility, then be allowed to settle before discharge into the environment; and • A stormwater management plan must be compiled and approved by DWS and implemented.	
	Contamination of stormwater runoff and ground water, caused by: • Spills and leaks of cement; • Chemicals such as hydrocarbon-	Surface water and groundwater resources	Construction	Low (-)	**Prevent and reduce through management measures.** In accordance with Government Notice 704 (GN 704), the onsite management should: • Keep clean and dirty water separated; • Contain any dirty water within a dirty water system; • Prevent the contamination of clean water.	Very Low (-)

	based fuels and oils or lubricants spilled from construction vehicles; and • Other chemicals from construction activities e.g. paints.				• Where possible, the disturbance of land during the construction phase will be confined to areas which are disturbed for the operation of the mine. • Hydrocarbon spills will require immediate attention and should be disposed of at a reputable hazardous waste facility. All used hydrocarbons will be collected and recycled. • Storm water drainage and pollution control facilities will be constructed to divert the flow of water and separate clean and dirty water on site. • All licenses and permits required as per the National Water Act will be applied for the relevant water uses. • All areas where diesel is unloaded and loaded will be concreted and bunded. In order to achieve these objectives, the following stormwater management measures must be implemented on the site to ensure that that potential stormwater impacts are kept to a minimum: • Clean and dirty stormwater needs to be separated. Dirty stormwater may not be released into the environment and should be contained and treated on site; • All temporary storm water infrastructure (if any) on-site shall be maintained and kept clean throughout the construction period; • Immediate reporting of any polluting or potentially polluting incidents so that appropriate measures can be implemented; • Fuel and oil spills shall be treated immediately by appropriate mop-up products. Several hydrocarbon absorption/remediation products	

					(i.e. Spill kits) must be placed throughout the site; • Use of bunds or traps to ensure full containment of hydrocarbon and other hazardous materials are mandatory; • Any contaminated material is disposed of in an appropriate manner and the potential risks associated with such spills are limited; • Stormwater leaving the site must in no way be contaminated; • Ensure good housekeeping practices; • Increased runoff should be managed using berms and other suitable structures as required to ensure flow velocities are reduced; and • Removal of spills, rainwater and waste produced during clean-up of the bunds – shall be done in accordance to relevant specifications.	
	Altered drainage patterns and stormwater runoff flows.	Surface water	Construction	Very low (-)	**Control through management measures.** A stormwater management plan including stormwater management measures during all phases of the proposed development will be compiled by a suitably qualified person. The plan is to include a detailed description of the stormwater management plan, incorporating appropriate maps; • Alternatively, should there be an existing stormwater management plan, this plan should be amended to include all phases of the waste rock beneficiation facilities.	Very Low (-)
	Contaminated surface water following rainfall	Surface water	Construction	Low (-)	**Control through management measures.** A stormwater management plan including stormwater management measures during all phases of the proposed development will be compiled by a suitably qualified person. The plan is to include a	Very Low (-)

					detailed description of the stormwater management plan, incorporating appropriate maps; Alternatively, should there be an existing stormwater management plan, this plan should be amended to include all phases of the waste rock beneficiation facilities.	
	Potential decrease in significant biodiversity on the study and surrounding area.	Biodiversity	Construction	Very Low (-)	**Reduce through management measures.** • Only vegetation falling directly in demarcated access routes or project sites should be removed; • No further vegetation clearance except for the removal of alien invasive species will be allowed; and • All remaining indigenous vegetation should be conserved wherever possible	Very Low (-)
	Potential loss of significant vegetation type, ecologically important species and species of conservation concern.	Biodiversity	Construction	Very Low (-)	**Prevent and reduce through management measures.** • Remove and relocate any rare, endangered, protected and endemic species within the areas of activity and within 100 m of any activity. • Prevent the unnecessary destruction of the vegetation of sensitive areas outside the footprint, preferably by designating them as 'no go' areas and setting them up as conservation areas. • Any stormwater cut-off channels should be kept as natural as possible with gentle slopes (45° angle or less) on the side away from mining activities. Channels should also have rough surfaces and rocks, less "curvature" on the walls to enable smaller animals to escape. A "step" in the slope of the walls and a "lip" on the edge of the channel will deter animals from entering the channels;	Very Low (-)

					• Only vegetation falling directly in demarcated access routes or project sites should be removed; • No further vegetation clearance except for the removal of alien invasive species will be allowed; and • All remaining indigenous vegetation should be conserved wherever possible.	
	Spreading of alien invasive species and bush encroachment of indigenous species.	Biodiversity Soils	Construction	Very Low (-)	**Prevent and control through management measures.** • An alien vegetation management plan should be compiled and implemented; • Regular removal of invasive alien species should be undertaken. This should extend through to the closure phase of the project; and • No spreading of alien vegetation onto adjacent properties should be allowed.	Very Low (-)
	Impact on natural migratory routes and faunal dispersal patterns.	Biodiversity	Construction	Very Low (-)	**Reduce and control through management measures.** • Reduce the levels of disturbance on areas indicated by the Environmental Control Officer (ECO) as migratory routes, if any.	Very Low (-)
	Disturbance and loss of fauna through noise, light and dust pollution and hunting, trapping and killing of fauna.	Biodiversity	Construction	Low (-)	**Reduce through controlling measures.** • Environmental awareness training should include that no hunting, trapping or killing of fauna are allowed; • Any animals rescued or recovered will be relocated in a suitable habitat away from the operations and associated infrastructure; • Any lizards, snakes or monitors encountered should be allowed to escape to a suitable habitat away from disturbance. • No reptile should be intentionally killed, caught or collected during any phase of the project; and	Very Low (-)

					• General avoidance of snakes is the best policy if encountered. Snakes should not be intentionally harmed or killed and allowed free movement away from the area.	
	Loss of land for other purposes e.g. cultivation.	Land use	Construction	Medium (-)	None	Low (-)
	Alteration of archaeological, historical and palaeontological resources that may be discovered during earthworks.	Heritage	Construction	Very Low (-)	Application to be submitted to SAHRA during PPP phase. Comments will be included in the final EMPr for safeguarding heritage resources.	Very Low (-)
	Visibility from sensitive receptors / visual scarring of the landscape as a result of the construction activities.	Aesthetic environment	Construction	Low (-)	**Reduce through controlling management measures.** • Housekeeping on site should be enforced; • Rehabilitation measures such as re-vegetation to be undertaken; • Install lights that will not create a night sky glow; • Reduce the construction period through careful planning and productive implementation of resources; • Plan the placement of lay-down areas and any potential temporary construction camps in order to minimise vegetation clearing; • Restrict the activities and movement of construction workers and vehicles to the immediate construction site and existing access roads; • Ensure that rubble, litter and issued construction materials are managed and removed regularly; • Ensure that all infrastructure and the site and general surrounds are maintained in a neat and	Low (-)

					appealing way; and • Reduce and control construction dust through the use of approved dust suppression techniques.	
	Nuisance and health risks caused by an increase in the ambient noise level as a result of noise impacts associated with the operation of construction vehicles and equipment.	Social and Health Ambiance "Sense of Place"	Construction	Low (-)	**Reduce through controlling measures.** • Vehicles will be regularly serviced to ensure acceptable noise levels are not exceeded. Silencers will be utilised where possible; • Noise levels should be kept within acceptable limits. All noise and sounds generated should adhere to South African Bureau of Standards (SABS) specifications for maximum allowable noise levels for construction sites. No pure tone sirens or hooters may be utilised except where required in terms of SABS standards or in emergencies; • With regard to unavoidable very noisy construction activities in the vicinity of noise sensitive areas, the Site Manager (SM) should liaise with local residents and how best to minimise impacts, and the local population should be kept informed of the nature and duration of intended activities; • The SM should take measures to discourage labourers from loitering in the area, causing noise disturbance; • Noise impacts should be minimised by restricting construction to Business hours on Monday to Friday, and Business Hours on Saturdays and Sundays, during which the offending activities are carried out and, where possible; by insulating machinery and/or enclosing areas of activity; • Should complaints be received, monitoring of	Very Low (-)

					noise levels at various, pre-determined locations must take place. This will serve as the core of noise mitigation as it will enable the determination of problem areas; • Personal Protective Equipment to all persons working in areas where high levels of noise can be expected; Signs where it is compulsory; • Proper design of the plant areas and machinery where measures are taken to prevent noise generation such as silencers, mufflers and sound suppressing enclosures for parts/processes which can generate noise; • Regular inspections and maintenance of equipment, vehicles and machinery to prevent unnecessary noise; • Noise breaking barriers can be erected such as netting; • Placement of noise generating activities can be planned as far away as possible from affected areas or persons.	
	Security lighting on surrounding landowners and nocturnal animals.	Fauna Social and health	Construction	Very Low (-)	• Unnecessary lights should be switched off during the day and / or night to avoid light pollution; • If lighting is required, the lighting will be located in such a place and such a manner so as to minimise any impact on the surrounding community; • Install lights that will not create a night sky glow; and • Security lighting should be designed in such a way as to minimise emissions onto undisturbed areas on site and neighbouring properties. Light fittings should face downwards.	Very Low (-)
	Increased dust	Health and	Construction	Low (-)	**Reduce through controlling measures.**	Very Low (-)

	pollution due to vegetation clearance and construction vehicles and activities.	Social			• Dust suppression shall be implemented during dry periods and windy conditions; • All exposed surfaces should be minimised in terms of duration of exposure to wind and stormwater; • Excavation, handling and transportation of erodible materials shall be avoided under high wind conditions (excess of 35km/hr) / when visible dust plume is present; • Ensure that shortest routes are used for material transport; • Ensure that stockpile height is kept to a minimum and that any stockpiling occurs downwind of the stockpiles; • Minimise travel speed on paved roads; • Implement monthly site inspection to check for possible areas of dust generation not addressed or not effectively managed; • Spray areas to be cleared with water. • Ensure minimum travel distance between working areas and stockpiles. • Ensure that topsoil for stockpiles is sprayed with water before tipping to prevent dust generation. • Ensure graded areas are sprayed with water. • Minimise the amount of graded areas. • Load and offload material, as far as possible, downwind of stockpiles. • Should complaints be received, actively monitor dust fallout generated in the 8 major wind directions on the borders of the site.	
	Windborne dust (soil) and vehicle fumes and particulate matter PM10, altering air	Health and social	Construction	Low (-)	**Reduce through controlling measures.** • Dust suppression shall be implemented during dry periods and windy conditions; • All exposed surfaces should be minimised in	Very Low (-)

	quality.				terms of duration of exposure to wind and stormwater; • Excavation, handling and transportation of erodible materials shall be avoided under high wind conditions (excess of 35km/hr) / when visible dust plume is present; • Ensure that shortest routes are used for material transport; • Ensure that stockpile height is kept to a minimum and that any stockpiling occurs downwind of the stockpiles; • Minimise travel speed on paved roads; • Implement monthly site inspection to check for possible areas of dust generation not addressed or not effectively managed; • Spray areas to be cleared with water. • Ensure minimum travel distance between working areas and stockpiles. • Ensure that topsoil for stockpiles is sprayed with water before tipping to prevent dust generation. • Ensure graded areas are sprayed with water. • Minimise the amount of graded areas. • Load and offload material, as far as possible, downwind of stockpiles. • Implement monthly site inspection to check for possible areas of dust generation not addressed or not effectively managed. • Should complaints be received, actively monitor dust fallout generated in the 8 major wind directions on the borders of the site.	
	Generation of additional general waste, litter and building rubble and	Health and Safety and fauna and flora / ecosystems.	Construction	Low (-)	**Control through management measures.** • The conditions of the Integrated Water Use License (IWUL) and the IWWMP for the Millsell mine must be implemented.	Very Low (-)

	hazardous material during the construction phase.				• A central waste storage and transition area shall be established within the site camp; • The central waste storage and transition area shall be surfaced and demarcated appropriately; • Portable wheelie bins shall be placed throughout the site camp as well as at the remainder of the site and at all working areas in the field; • Wheelie bins shall be colour coded and labelled to identify the waste stream for which it is intended; All portable wheelie bins and other containers shall be emptied at the central waste storage and transition area a minimum of once a week as to avoid waste build up; • The waste shall be removed (within 30 days) by a licensed waste service provider and shall be disposed of at a licensed waste landfill site and records of safe disposal (as required for hazardous wastes) shall be supplied to the Contractor. These records shall be kept on site by the ESM. • Wherever possible and practical, waste materials generated on site must be recycled; and • Waste specific (hazardous, timber, steel etc.) mitigation measures to be developed and included in the EMPR.	
	Need for services i.e. water, electricity and sewerage systems during the construction phase causing additional strain on	Natural resources including water and electricity.	Construction	Very Low (-)	**Reduce through controlling management measures.** • Energy savings measures to be implemented at the construction sites, e.g.: ➢ No lights to be switched on unnecessarily. Only security lights to be switched on at	Very Low (-)

	natural resources and service infrastructure.				night; • Energy saving bulbs to be installed; and • Water should be recycled as far as possible to avoid any additional water usage.	
	The change in traffic patterns as a result of traffic entering and exiting the site on the surrounding road infrastructure and existing traffic.	Safety and Social	Construction	Very Low (-)	**Reduce through controlling management measures.** • Where feasible, heavy vehicles should not operate on public roads during peak hours; and • Heavy vehicles should adhere to the speed limit of the road.	Very Low (-)
	Nuisance, health and safety risks caused by increased traffic on and adjacent to the study area including cars, busses and other heavy vehicles.	Health and Safety	Construction	Very Low (-)	**Prevent through controlling management measures.** • Drivers will be enforced to keep to set speed limits. • Trucks will be in a road-worthy condition. • Roads and intersections will be signposted clearly. Only main roads should be used; • Vehicles should adhere to the speed limit of the road; • Heavy vehicles should always travel with their head lights switched on; • Heavy vehicles should not stop on the road to pick up hitchhikers – No stopping on the road approaching the mine will be allowed; • Single directional traffic shall be controlled through a stop-go system or any other appropriate traffic control method; • Samancor Chrome Millsell mine shall be responsible for ensuring that suitable access is maintained for public traffic to all relevant businesses and properties; • Where feasible, heavy vehicles should not operate on public roads during peak hours; and	Very Low (-)

					• All traffic accommodation measures are to conform to the latest edition of the South African Road Signs Manual	
	Possibility of construction activities and workers causing veld fires, which can potentially cause injury and or loss of life of construction workers and surrounding landowners, visitors and workers.	Health and Safety	Construction	Low (-)	**Prevent through controlling management measures.** • All workers will be sensitised to the risk of fire; • Smoking is only allowed in designated smoking areas and disposal of cigarette butts safely in sand buckets; • The Applicant shall ensure that the basic fire-fighting equipment is available on the site; • Extinguishers should be located outside hazardous materials and chemicals storage containers; Fire response and evacuation • An Emergency Plan (including Fire Protection, Response and Evacuation Plan) is to be prepared by the contractors and conveyed to all staff on the site' • Identify major risks to minimise the environmental impacts e.g., air pollution and contaminated effluent runoff.	Very Low (-)
	Increased risk to public health and safety: Dangerous areas and construction activities poses health risks and possible loss of life to construction workers and visitors to the site. If not fenced off, the public and workers may fall into excavated	Health and Safety	Construction	Low (-)	**Prevent through controlling management measures.** • A health and safety plan in terms of the Mine Health and Safety Act (Act 29 of 1996) should be compiled and implemented to ensure worker safety; • A health and safety control officer should monitor the implementation of the health and safety plan for the construction phase; • Regular health and safety audits should be conducted and documented; and a record of	Very Low (-)

	areas and trenches.				health and safety incidents should be kept on site and made available for inspection; • Any health and safety incidents should be reported to the Site Manager (SM) immediately; • First aid facilities should be available on site at all times; • Workers have the right to refuse work in unsafe conditions; • Material stockpiles or stacks should be stable and well secured to avoid collapse and possible injury to site workers. • Access to construction sites must be controlled; • Excavated areas should be temporarily fenced-off; and • Excavations, such as pipeline excavations, will be backfilled and landscaped as soon as possible.	
	Potential creation of short term employment opportunities for the local communities, during the construction phase.	Socio-economic environment	Construction	Low (+)	• Skills training to be in accordance with the approved Social and Labour Plan; • Labourers should initially be sought locally and only regionally if skills are not available; and • The approved Social and Labour Plan should be implemented.	Low (+)
Operational Phase: Transportation / transfer of the material and product to and from the plant Stockpiling of raw material and product	Soil compaction and degradation through vehicles driving and employees walking over open areas, as well as compaction through stockpiling.	Soil	Operational	Medium (-)	**Reduce and remedy through controlling management measures.** • The approved stormwater management plan must be implemented; • Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants; and • Soils compacted, should be deeply ripped at least to a depth of 300mm to loosen compacted layers and re-graded to even running levels.	Low (-)
Maintenance of plant,	Contamination of soils.	Soil	Operational	Medium (-)	**Prevent through controlling management**	Low (-)

machinery and vehicles. Dust suppression General and hazardous waste generation through everyday operations Daily traffic on haul road Maintenance of the haul road Loading, hauling and transport					**measures.** • All vehicles and machinery will be regularly serviced to ensure they are in proper working condition and to reduce risk of leaks; • All leaks will be cleaned up immediately using an absorbent material and spill kits in the prescribed manner; and • The approved Integrated Water and Waste Management Plan to be implemented. ***Hydrocarbons and hazardous waste*** • All hazardous waste generated shall be kept separate and shall not be mixed with general waste; and • All hazardous waste shall be stored within a sealed drum on an impermeable surfaced area within the central waste storage and transition area.	
Crushing and screening of material	Stormwater, erosion and siltation impacts due to a lack of implementing measures to manage stormwater run-off quantity and quality during the operational phase.	Surface water	Operational	Medium (-)	**Reduce and remedy through controlling management measures.** • The ESM should ensure that excessive quantities of sand, silt and silt-laden water do not enter the stormwater system; • Appropriate measures, e.g. construction of silt traps, or drainage retention areas to prevent silt and sand entering drainage or watercourses should be taken; • No wastewater may run freely into any of the surrounding naturally vegetated areas; • Erosion and subsequent siltation must be limited; • Any drainage channels shall be suitably designed to ensure that erosion does not occur; • All areas susceptible to erosion shall be protected and stabilisation measures	Very Low (-)

					implemented; • Packing of sandbags, gabions, straw bales or brush to reduce the speed of water flow where water is scouring the topsoil and results in the formation of erosion gullies; • Any surface runoff generated which has a high suspended solid content shall be collected at the point source in an appropriate containment facility, then be allowed to settle before discharge into the environment; and • A stormwater management plan must be compiled; and should be approved by DWS and implemented.	
	Contamination of stormwater runoff and groundwater, caused by: • Sediment release; • Chemicals such as hydrocarbon-based fuels and oils or lubricants spilled from construction vehicles; • Other checmicals from maintenance activities e.g. paints; and • Effluent discharges, due to a lack of stormwater management and	Surface water and groundwater	Operational	Low (-)	**Prevent through controlling management measures.** In accordance with Government Notice 704 (GN 704), the onsite management should: • Keep clean and dirty water separated; • Contain any dirty water within a system; and • Prevent the contamination of clean water. In order to achieve these objectives, the following stormwater management measures must be implemented on the site to ensure that that potential stormwater impacts are kept to a minimum: • Clean and dirty stormwater needs to be separated. Dirty stormwater may not be released into the environment and should be contained and treated on site; • The operation and maintenance of the stormwater and waste water containment facilities shall be done in accordance with the requirements of the Integrated Water Use License and Integrated Water and Waste	Very Low (-)

	system maintenance.				Management Plan (IWWMP); • Immediate reporting of any polluting or potentially polluting incidents so that appropriate measures can be implemented; • Fuel and oil spills shall be treated immediately by appropriate mop-up products. Several hydrocarbon absorption/remediation products (i.e. Spill kits) must be placed at varous locations on the site; • Use of bunds or traps to ensure full containment of hydrocarbons and other hazardous materials are mandatory during maintenance; • Any contaminated material is disposed of in an appropriate manner and the potential risks associated with such spills are limited; • Stormwater leaving the operations must in no way be contaminated by any substance, whether such substance is a solid, liquid, vapour or gas or a combination thereof which is produced, used, stored, dumped or spilled on the premises; • During maintenance, all hazardous substances should be stored on impervious surfaces that allow for the containment of spills and leakages (e.g. bunded areas). Should spills occur, these should be reported to the ESM. • Liquid hazardous waste shall be contained and stored according to the prescribed measures where required; • Groundwater monitoring and surface water monitoring should be conducted in line with the WUL or general practice for water monitoring at crushing and screening plants; • Increased runoff should be managed using	

					berms and other suitable structures as required to ensure flow velocities are reduced; and • Removal of spills, rainwater and waste produced during clean-up of the stormwater infrastructure – shall be done in accordance to relevant specifications.	
	Groundwater contamination from stockpiles. Seepage from stockpiles could cause a contamination plume affecting the underground water resources.	Groundwater	Operational	Low (-)	**Prevent through controlling management measures.** • Storage and classification of hazardous waste to be in accordance with the waste classification and management regulations GNR 634-635.	Very Low (-)
	Surface water contamination from residue stockpiles.	Surface water	Operational	Low (-)	**Prevent through controlling management measures.** • Storage and classification of hazardous waste to be in accordance with the waste classification and management regulations GNR 634-635.	Very Low (-)
	Disturbance and loss of fauna through noise, light and dust pollution and hunting, trapping and killing of fauna.	Biodiversity	Operational	Very Low (-)	**Prevent or reduce through management measures.** • Environmental awareness training should include that no hunting, trapping or killing of fauna are allowed; • Any animals rescued or recovered will be relocated in suitable habitat away from the crushing and screening operations and associated infrastructure; • Any lizards, snakes or monitors encountered should be allowed to escape to suitable habitat away from disturbance. • No reptile should be intentionally killed, caught or collected during any phase of the project; and • General avoidance of snakes is the best policy	Very Low (-)

					if encountered. Snakes should not be intentionally harmed or killed and allowed free movement away from the area.	
	Spreading of alien invasive species and bush encroachment of indigenous species.	Biodiversity and soils	Operational	Low (-)	**Prevent and control through management measures.** • An alien vegetation management plan should be compiled and implemented; • Regular removal of invasive alien species should be conducted. This should extend right through to the closure phase of the project; and • No spread of alien vegetation onto adjacent properties should be allowed.	Very Low (-)
	Possibility of activities and workers causing veld fires destroying veld and animals on the study area and on adjacent land, impacting on the livelihood of surrounding land owners and users.	Health, Safety and Economic environment and land use	Operational	Low (-)	**Prevent and control through management measures.** • All workers will be sensitised to the risk of fire; • Smoking is only allowed in designated smoking areas and disposal of cigarette butts safely in sand buckets; • The Applicant shall ensure that the basic fire-fighting equipment is available in vehicles; and • Extinguishers should be located outside hazardous materials and chemicals storage containers; **Fire response and evacuation** • An Emergency Plan (including Fire Protection, Response and Evacuation Plan) is to be prepared by the Applicant and conveyed to all staff on the site during induction; and • Identify major risks to minimise the environmental impacts e.g. air pollution and contaminated effluent runoff.	Very Low (-)
	Alteration of archaeological,	Heritage	Operational	Very Low (-)	SAHRA recommendations provided during PP to be included in the EMPR for the safeguarding of	Very Low (-)

	historical and palaeontological resources that may be discovered during earthworks.				heritage resources.	
	Visibility from sensitive receptors / visual scarring of the landscape and impact on 'Sense of Place' as a result of the visibility of the the facility.	Aesthetic environment	Operational	High (-)	**Reduce through management measures.** • The structures need to be constructed in such a way that they are stable; • Avoid any highly reflective material in operations; • Ensure that all infrastructure and the site and general surroundings are maintained in a neat and appealing way; and • Rehabilitation of disturbed areas and re-establishment of vegetation.	Medium (-)
	Visibility of solid domestic and operational waste.	Aesthetic environment	Operational	Medium (-)	**Reduce and control through management measures.** • Housekeeping should be enforced.	Low (-)
	Nuisance and health risks caused by an increase in the ambient noise level as a result of noise impacts associated with the operations	Health and Safety	Operational	Medium (-)	**Reduce and control through management measures.** • Vehicles will be regularly serviced to ensure acceptable noise levels are not exceeded. Silencers will be utilised where possible; • Noise levels should be kept within acceptable limits. All noise and sounds generated should adhere to South African Bureau of Standards (SABS) specifications for maximum allowable noise levels for mining sites. No pure tone sirens or hooters may be utilised except where required in terms of SABS standards or in emergencies; • The ESM should take measures to discourage labourers from loitering in the area and causing noise disturbance;	Low (-)

					• If there are any noise complaints, a noise impact assessment should be conducted to determine the noise impacts on that specific location and appropriate measures for mitigation proposed by the specialist implemented. • Regular inspections and maintenance of equipment, vehicles and machinery to prevent unnecessary noise; • Noise breaking barriers can be erected such as netting, walls or high growing trees.	
	Disturbance due to vibrations caused by heavy vehicles	Health, Social and biodiversity	Operational	Medium (-)	**Reduce and control through management measures.** • Vehicles will be regularly serviced; • Heavy vehicle traffic should be routed away from sensitive areas, where possible; • Regular inspections and maintenance of equipment, vehicles and machinery to prevent unnecessary vibrations.	Low (-)
	Impact of security lighting on surrounding landowners and animals.	Health, Social and biodiversity	Operational	Low (-)	**Reduce and control through management measures.** • Unnecessary lights should be switched off during the day and / or night to avoid light pollution; • If lighting is required, the lighting will be located in such a place and such a manner so as to minimise any impact on the surrounding community and / or environment; • Security lighting should be designed in such a way as to minimise emissions onto undisturbed areas on site and neighbouring properties. Light fittings should face downwards; • Mitigation of lighting impacts includes the pro-active design, planning and specification lighting for the facility by a lighting engineer;	Very Low (-)

					• Shielding the sources of light by physical barriers (vegetation, or the structure itself); • Limiting mounting heights of lighting fixtures by specifying foot-lights or bollard level lights; • Making use of minimum lumen or wattage in fixtures; • Making use of down-lighters or shielded fixtures; and • Making use of energy efficient lighting or other types of low impact lighting.	
	Increased dust pollution (soil and ore fines), vehicles on haul roads	Health and Safety	Operational	Medium (-)	**Reduce and control through management measures.** • Dust suppression shall be implemented during dry periods and windy conditions; • Minimise travel speed on paved roads; • Implement monthly site inspection to check for possible areas of dust generation not addressed or not effectively managed; • Ensure the access roads are all well maintained in terms of surface and especially dust suppression. • Ensure that shortest routes are used for material transport. • Spray unpaved roads with water/dust binding materials and limit travel speed to a minimum. • Minimise travel speed on paved roads. • Ensure that stockpile height is kept to a minimum and that any stockpiling occurs downwind of the existing stockpiles; • Ensure crushers are properly enclosed and/or fitted with water sprays to reduce dust generation. • Current dust monitoring practices should continue at the Millsell operations. Should	Very Low (-)

					complaints be received, actively monitor dust fallout generated around the crushing and screening plant in the 8 major wind directions on the borders of the site.	
	Increased windborne dust (soil and ore fines), vehicle fumes and particulate matter PM10, altering air quality.	Health and Safety	Operational	Medium (-)	**Reduce and control through management measures.** Refer to mitigation measures above.	Very Low (-)
	Generation and disposal of additional general waste, litter and hazardous material during the operational phase and operational waste	Health and Safety and fauna and flora / ecosystems.	Operational	Medium (-)	**Reduce and control through management measures.** • Implement monthly site inspection to check for possible areas of waste generation not addressed or not effectively managed; • The conditions of the Integrated Water Use License (IWUL) and the IWWMP for the Millsell mine must be implemented. • A central waste storage and transition area shall be established within the site; • The central waste storage and transition area shall be surfaced and demarcated appropriately; • Portable wheelie bins shall be placed throughout the site camp as well as at the remainder of the site and at all working areas in the field; • Wheelie bins shall be colour coded and labelled to identify the waste stream for which it is intended; All portable wheelie bins and other containers shall be emptied at the central waste storage and transition area a minimum of once a week as to avoid waste build up;	Very Low (-)

					• The waste shall be removed (within 30 days) by a licensed waste service provider and shall be disposed of at a licensed waste landfill site and records of safe disposal (as required for hazardous wastes) shall be supplied to Millsell. These records shall be kept on site by the ESM. • Wherever possible and practical, waste materials generated on site must be recycled; and • Waste specific (hazardous, timber, steel etc.) mitigation measures to be developed and included in the EMPR.	
	Need for services e.g. water, electricity and sewerage systems, causing additional strain on natural resources and service infrastructure.	Natural resources: water and electricity	Operational	Very Low (-)	**Reduce and control through management measures.** • Energy savings measures to be implemented, e.g.: ➢ No lights to be switched on unnecessarily. Only security lights to be switched on at night; • Energy saving bulbs to be installed; and • Water should be recycled as far as possible to avoid any additional water usage.	Very Low (-)
	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.	Health and Safety	Operational	Medium (-)	**Reduce and control through management measures.** • Heavy vehicles should adhere to the speed limits and other rules of the road; and • Access should be controlled and potential road upgrades implemented;	Low (-)
	Nuisance, health and safety risks caused by increased traffic on and adjacent to the	Health and Safety	Operational	Medium (-)	**Prevent through management measures.** • Trucks will be in a road-worthy condition. • Roads and intersections will be signposted clearly. Only main roads should be used;	Low (-)

	study area.				• Vehicles should adhere to the speed limit of the road; • Heavy vehicles should always travel with their head lights switched on; • Heavy vehicles should not stop on the road to pick up hitchhikers – No stopping on the road approaching the mine will be allowed; • Millsell shall be responsible for ensuring that suitable access is maintained for public traffic to all relevant businesses and properties. • Drivers will be enforced to keep to set speed limits. • Single directional traffic shall be controlled through a stop-go system or any other appropriate traffic control method; • All traffic accommodation measures are to conform to the latest edition of the South African Road Signs Manual.	
	Possibility of 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.	Health and Safety	Operational	Low (-)	**Prevent and control through management measures.** • All workers will be sensitised to the risk of fire; • Smoking is only allowed in designated smoking areas and disposal of cigarette butts safely in sand buckets; • The Applicant shall ensure that the basic fire-fighting equipment is available trucks; and • Extinguishers should be located outside hazardous materials and chemicals storage containers. **Fire response and evacuation** • An Emergency Plan (including Fire Protection, Response and Evacuation Plan) is to be prepared by the Applicant and conveyed to all	Very Low (-)

					staff; and • Identify major risks to minimise the environmental impacts e.g. air pollution and contaminated effluent runoff.	
	Increased risk to public health and safety: Dangerous areas including the concrete construction areas poses health risks and possible loss of life to mine workers and visitors to the site.	Health and Safety	Operational	Low (-)	**Prevent through management measures.** • A health and safety plan in terms of the Mine Health and Safety Act (Act 29 of 1996) should be compiled and implemented to ensure worker safety; • A health and safety control officer should monitor the implementation of the health and safety plan for the operational phase; • Regular health and safety audits should be conducted and documented; and a record of health and safety incidents should be kept on site and made available for inspection; • Any health and safety incidents should be reported to the Site Manager (SM) immediately; • First aid boxes should be available in trucks at all times; • Workers have the right to refuse work in unsafe conditions; and • Material stockpiles or stacks on the site should be stable and well secured to avoid collapse and possible injury to site workers.	Very Low (-)
	Socio-economic impact on farmers, labourers and surrounding landowners and residents due to negative impacts on groundwater, dust pollution, noise	Socio-economic Environment	Operational	High (-)	**Reduce through management measures.** Refer to the above-mentioned mitigation measures for noise, dust and other environmental impacts.	Low (-)

	pollution etc.					
	Economic impact should there be an incident of public health and safety	Socio-economic Environment	Operational	Very Low (-)	Reduce through management measures. Refer to the above-mentioned mitigation measures for noise, dust and other environmental impacts.	Very Low (-)
	Extended employment provision due to the implementation of the waste management activities, allowing mining activities and re-mining of tailings to continue for additional years.	Socio-economic Environment	Operational	High (+)	• Proceed with the proposed activity.	High (+)
	Sourcing supplies from local residents and businesses boosting the local economy for an extended period of time.	Socio-economic Environment	Operational	Medium (+)	Proceed with the proposed activity.	Medium (+)
Closure and Post-Closure Phases Vehicles driving on open areas Spillage of hazardous materials Decommissioning of conveyors, crushers and screens	All of the impacts described above will be applicable to the closure phase.	All aspects as described above	Closure and Post-Closure Phases	Very Low – High (-)	Refer to the above mitigation measures for impacts during the operational phase.	Although it is expected that impacts can be mitigated to acceptable levels, there is still a very low to low overall risk for negative impacts on the bio-physical and socio-economic environment.

The supporting impact assessment conducted by the EAP must be attached as an appendix, marked **Appendix.** ***Please note that the full impact assessment is provided in Tables 12 – 15 of this report and is not separately appended.***

i) Summary of specialist reports.

(This summary must be completed if any specialist reports informed the impact assessment and final site layout process and must be in the following tabular form): -

Table 20: Summary of specialist reports

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X where applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED.
Phase 1 Archaeological Impact Assessment for a portion of portion of the farm Waterkloof JQ, Rustenburg, North West (T Coetzee, August 2015)	Because archaeological artefacts generally occur below surface, the possibility exists that culturally significant material may be exposed during the development and construction phases, in which case all activities must be suspended pending further archaeological investigations by a qualified archaeologist. Also, should skeletal remains be exposed during development and construction phases, all activities must be suspended and the relevant heritage resources authority contacted (See National Heritage Resources Act, 25 of 1999 section 36 (6)).	**X**	Part B: EMPR
	Should the need arise to expand the development beyond the surveyed area mentioned in this study, the following applies: a qualified archaeologist must conduct a full Phase 1 Archaeological Impact Assessment (AIA) on the sections beyond the demarcated area which will be affected by the development, in order to determine the occurrence and extent of any archaeological sites and the impact development might have on these sites.	**X**	Part B: EMPR
	From a heritage point of view, development may proceed on the demarcated portion of portion 410 of the farm Waterkloof 305 JQ, subject to the abovementioned conditions, recommendations and approval by the South African Heritage Resources Agency.	**X**	Part B: EMPR
Ecological Scan for the proposed expansion of the Tailings Storage Facility and Waste Rock Dump at Samancor Chrome Ltd.'s Millsell Mine, Kroondal, North West Province (H Badenhorst, August 2015)	The loss of flora found on site is a foregone conclusion, however the disturbance caused by the tailings dam facility is likely to encourage the growth of alien invasive flora on disturbed areas, it is recommended that Samancor appoint a specialist to design a site specific Alien Invasive Management plan (AIM)	**X**	Part B: EMPR
	Should the Southern African Python, Giant Bullfrogs or any herpetological species be encountered during the mining activities, these should be relocated to natural areas in the vicinity. This remedial action requires the employment of a herpetologist to oversee the removal of any herpetofauna during the initial ground clearing phase (i.e. initial ground-breaking by earthmoving equipment). Giant Bullfrogs (*Pyxicephalus adspersus*) should be released at the nearest breeding	**X**	Part B: EMPR

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X where applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED.
	site. Any sensitive herpetofauna that are inadvertently killed during earthmoving operations should be preserved as museum voucher specimens.		
	Any stormwater cut-off channels should be kept as a natural as possible with gentle slopes (angle 45°or less) on the side away from the mining activities. These channels should enable reptiles and amphibians which have fallen into the channel accidently to escape easily. If not, they could drown if the channels contain water or they may die of exposure when the channels are dry.	**X**	Part B: EMPR
	For the safety of the animals it is not so much the width and depth of a drainage/storm water channel that are important, but the shape. If it has curved, smooth walls the animals that have fallen in will find it impossible to obtain purchase and will slip back time and time again and fall to the bottom of the channel. The channel must be designed in such a way as to prevent the smaller creatures from blundering in and dying. Safety features that could be incorporated into the drainage/storm water channel are the use of rough surfaces and rocks to allow trapped animals purchase, less curvature on the walls, a "step" in the slope of the wall and a "lip" along the edges of the channel which would either act as a deterrent to small animals or as an absolute physical barrier.	**X**	Part B: EMPR
Air quality Baseline Report for the Proposed expansion of the TSF and waste rock dump at Samancor Chrome Ltd.'s Millsell Mine, Kroondal, North West Province for Portion 410 of the Farm Waterkloof 305 JQ. (J Nortje, July 2015)	Speed limit of 30 km/h on site for all vehicles is implemented once the site becomes operational.	**X**	Part B: EMPR
	With proper dust suppression techniques, minimal dust fallout (in a virtual sense that none of the limits as specified in GNR827 will be exceeded) is expected. Even in a scenario where no dust suppression is applied, the dispersion of chrome dust (as modelled – see Section 7.3) will not exceed 200 m. This is far away from any of the sensitive receptors identified.	**X**	Part B: EMPR
Noise Baseline Report for the proposed expansion of the Tailings Storage Facility at Samancor Chrome's (Ltd.) Millsell Mine, Kroondal, North West Province (C.S. Schoeman, July 2015).	It is imperative that a noise monitoring programme and mitigation measures are implemented, in accordance with the requirements of the South African National Standard SANS 10103:2008, "The measurement and rating of environmental noise with respect to annoyance and to speech communication". The study should be conducted on a bi-annual basis in order to ensure compliance to the standards.	**X**	Part B: EMPR

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X where applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED.
Visual Impact Assessment for the proposed expansion of the Tailings Storage Facility and Waste Rock Dump at Samancor Chrome Ltd.'s Millsell Mine, Kroondal, North West Province (J Nortje, July 2015)	• Ensure that the design fits into the surrounding environment and it is aesthetically pleasing. • Ensure that all infrastructure and the site and general surroundings are maintained in a neat and appealing way; • Rehabilitation of disturbed areas and re-establishment of vegetation; • Mitigation of lighting impacts includes the pro-active design, planning and specification lighting for the facility by a lighting engineer. The correct specification and placement of lighting and light fixtures for the proposed development will go far to contain rather than spread the light. Additional measures include the following: • Shielding the sources of light by physical barriers (vegetation, or the structure itself); • Limiting mounting heights of lighting fixtures by specifying foot-lights or bollard level lights; • Making use of minimum lumen or wattage in fixtures; • Making use of down-lighters, or shielded fixtures; and • Making use of energy efficient lighting or other types of low impact lighting. • Secondary impacts anticipated as a result of the proposed facility (i.e. visual character, sense of place and tourism potential) are not possible to mitigate.	**X**	Part B: EMPR
Gehydrological Impact Assessment for the Proposed New Tailings Dam and Extension of the Rock Dump at Millsell Section, in terms of the National Water Act of 1998 (Act No. 36 of 1998) (A Mavurayi, July 2015)	Site and drill at least two monitoring boreholes at the rock dump (Waste Rock Beneficiation Facility). Siting of the boreholes should use geophysical survey to increase the chances of intersecting geological structures that influence groundwater flow at the site. Electromagnetic horizontal profiling is recommended in this regard. The possible positions of the geophysical survey lines are shown in Figure 11.1. One drilling site should be identified on each survey line, preferably close to the center.	Not required as the specialist report was compiled for a Waste Rock Dump not currently in the scope of work.	
	Water quality parameters to be monitored should include, but not limited to the following: _ Electrical conductivity, EC. _ Total dissolved solids, TDS. _ Acidity/alkalinity, pH. _ Calcium, Ca. _ Magnesium, Mg. _ Sodium, Na.		

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X where applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED.
	_ Potassium, K. _ Iron, Fe. Manganese, Mn. _ Copper, Cu. _ Lead, Pb. _ Zinc, Zn. _ Cadmium, Cd. _ Chromium, Cr. _ Chloride, Cl. _ Sulphate, SO4. _ Fluoride, F. _ Nitrate, NO3. _ Phosphate, PO4. _ Carbonate, CO3. _ Hydrogen carbonate, HCO3.		
	Groundwater sampling should be carried out quarterly; whilst groundwater level should be measured monthly.	**X**	Part B: EMPR
	SamancorCr's contingency plan to compensate groundwater users in the area whose resources may be affected by the development should remain open.	**X**	Part B: EMPR
	A groundwater flow and transport model should be developed for the site. The model will be used to predict potential long-term impacts of the two waste containment facilities around the site. The potential impacts to be simulated include the migration of contaminants from the site.	**X**	Part B: EMPR

Attach copies of Specialist Reports as appendices – ***Please refer to Appendix 7***

j) Environmental impact statement

(i) Summary of the key findings of the environmental impact assessment;

Table 21: Summary of Environmental Impacts

NATURE OF IMPACT	DESCRIPTION OF IMPACT	SIGNIFICANCE POST-MITIGATION
PREFERRED ALTERNATIVE – CONSTRUCTION PHASE		
GEOLOGY AND SOILS	Loss of topsoil	Very Low (-)
	Contamination of soils through: • Indiscriminate disposal of construction waste; and • Accidental spillage of chemicals such as hydrocarbon-based fuels and oils or lubricants spilled from construction vehicles and other chemicals from construction activities e.g. paints.	Very Low (-)
	Vehicle and personnel as well as storage of materials, equipment and stockpiling compaction and degradation impacts.	Very Low (-)
HYDROLOGY GROUNDWATER SURFACE WATER	Stormwater, erosion and siltation impacts due to a lack of implementing temporary measures to manage stormwater run-off quantity and quality during the construction phase.	Very Low (-)
	Contamination of stormwater runoff and ground water, caused by: • Spills and leaks of cement; • Chemicals such as hydrocarbon-based fuels and oils or lubricants spilled from construction vehicles; and • Other chemicals from construction activities e.g. paints.	Very Low (-)
	Altered drainage patterns and stormwater runoff flows.	Very Low (-)
	The runoff from the site following rainfall may be contaminated due to the activities and may contaminate surface water.	Very Low (-)
BIOLOGICAL FAUNA AND FLORA EXISTING LAND USE	Potential decrease in significant sensitive biodiversity on the study and surrounding area.	Very Low (-)
	Spreading of alien invasive species and bush encroachment of indigenous species.	Very Low (-)
	Impact on natural migratory routes and faunal dispersal patterns.	Very Low (-)
	Disturbance and loss of fauna through noise, light and dust pollution and hunting, trapping and killing of fauna.	Low (-)
	Potential loss of vegetation type, ecologically important species and species of conservation concern.	Very Low (-)
EXISTING LAND USE	Loss of land for other purposes e.g. cultivation.	Very Low (-)
ARCHAEO LOGICAL/ HERITAGE RESOURC	Alteration of archaeological, historical and palaeontological resources that may be discovered during earthworks.	Very Low (-)

NATURE OF IMPACT	DESCRIPTION OF IMPACT	SIGNIFICANCE POST-MITIGATION
VISUAL	Visibility from sensitive receptors / visual scarring of the landscape as a result of the construction activities.	Low (-)
NOISE 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 construction vehicles and equipment.	Very Low (-)
	Added impact of security lighting on surrounding landowners and nocturnal animals.	Very Low (-)
AIR QUALITY	Increased dust pollution due to vegetation clearance and construction vehicles and activities.	Very Low (-)
	Windborne dust (soil) and vehicle fumes and particulate matter PM10, altering air quality.	Very Low (-)
WASTE	Generation of additional general waste, litter and building rubble and hazardous material during the construction phase.	Very Low (-)
SERVICES	Need for services i.e. water, electricity and sewerage systems during the construction phase causing additional strain on natural resources and service infrastructure.	Very Low (-)
TRAFFIC HEALTH AND SAFETY	The change in traffic patterns as a result of traffic entering and exiting the site on the surrounding road infrastructure and existing traffic.	Very Low (-)
	Nuisance, health and safety risks caused by increased traffic on and adjacent to the study area including cars, busses and other heavy vehicles.	Very Low (-)
HEALTH AND SAFETY	Possibility of construction activities and workers causing veld fires, which can potentially cause injury and or loss of life to construction workers and surrounding landowners, visitors and workers.	Very Low (-)
	Increased risk to public and worker safety: If not fenced off, the public and workers may fall into excavated areas and trenches.	Very Low (-)
SOCIO-ECONOMIC	Positive: Potential creation of short term employment opportunities for the local communities, during the construction phase.	Low (+)
PREFERRED ALTERNATIVE – OPERATIONAL PHASE		
GEOLOGY AND SOILS	Soil erosion and soil compaction by heavy duty vehicles on site.	Low (-)
	Contamination of soils through: - 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.	Low (-)
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.	Very Low (-)
	Contamination of stormwater runoff, caused by:	Very Low (-)

NATURE OF IMPACT	DESCRIPTION OF IMPACT	SIGNIFICANCE POST-MITIGATION
	- Sediment release; - Chemicals such as hydrocarbon-based fuels and oils or lubricants spilled from vehicles; - Other chemicals from maintenance activities e.g. paints; and - Effluent discharges, due to a lack of stormwater management and system maintenance.	
	Groundwater ccontamination from storage of operational materials and hydrocarbons.	Very Low (-)
	Surface water contamination from residue stockpiles.	Very Low (-)
	The runoff from the plant area following reainfall may be contaminated due to the stockpiling, crushing and screening activities and may contaminate surface water.	Very Low (-)
BIOLOGICAL FAUNA AND FLORA	Disturbance and loss of fauna through noise, light and dust pollution and hunting, trapping and killing of fauna.	Very Low (-)
	Spreading of alien invasive species and bush encroachment of indigenous species.	Very Low (-)
EXISTING LAND USE	Possibility of transport activities and workers causing veld fires destroying veld and animals on the study area and on adjacent land, impacting on the livelihood of surrounding land owners and users.	Very Low (-)
ARCHAEOLOGICAL/HERITAGE RESOURCES	Alteration of archaeological, historical and palaeontological resources that may be discovered during earthworks.	Very Low (-)
VISUAL	Visibility from sensitive receptors / visual scarring of the landscape and impact on 'Sense of Place' as a result of the visibility of the facility.	Medium (-)
	Visibility of solid domestic and operational waste.	Low (-)
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 facility.	Low (-)
	Disturbance due to vibrations caused by vehicles.	Very Low (-)
	Impact of security lighting on surrounding landowners and animals.	Very Low (-)
AIR QUALITY	Increased dust pollution (soil and ore fines), vehicles on gravel roads.	Very Low (-)
	Increased windborne dust (soil and ore fines), vehicle fumes and particulate matter PM10, altering air quality.	Very Low (-)

NATURE OF IMPACT	DESCRIPTION OF IMPACT	SIGNIFICANCE POST-MITIGATION
WASTE (INCLUDING HAZARDOUS WASTE)	Generation and disposal of additional general waste, litter and hazardous material on or around the facility.	Very Low (-)
SERVICES	Need for services e.g. water, electricity and sewerage systems, causing additional strain on natural resources and service infrastructure.	Very Low (-)
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.	Low (-)
	Nuisance, health and safety risks caused by increased traffic on an adjacent to the study area including cars and heavy vehicles.	Low (-)
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.	Very Low (-)
	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.	Very Low (-)
SOCIO-ECONOMIC	Socio-economic impact on farmers, labourers and surrounding landowners and residents due to negative impacts on groundwater, dust pollution, noise pollution etc.	Low (-)
	Economic impact should there be an incident of public health and safety.	Very Low (-)
	Positive: Extended employment provision.	High (+)
	Positive: Sourcing supplies from local residents and businesses boosting the local economy for an extended period of time.	High (+)
PREFERRED ALTERNATIVE – DECOMMISSIONING AND CLOSURE PHASE		
GEOLOGY AND SOILS	Soil compaction by heavy duty vehicles on site.	Very Low (-)
	Contamination of soils through: • Indiscriminate disposal of waste; and • Accidental spillage of chemicals such as hydrocarbon-based fuels and oils or lubricants spilled from vehicles.	Very Low (-)
HYDROLOGY GROUNDWATER SURFACE WATER	Stormwater, erosion and siltation impacts due to a lack of implementing measures to manage stormwater run-off quantity and quality during the closure phase.	Very Low (-)
	Contamination of stormwater runoff and groundwater, caused by: • Sediment release; • Chemicals such as hydrocarbon-based fuels and oils or lubricants spilled from heavy duty vehicles; • Effluent discharges, due to a lack of stormwater management.	Very Low (-)
BIOLOGICAL FAUNA	Disturbance and loss of fauna through noise, light and dust pollution as well as hunting, trapping and killing of fauna.	Very Low (-)

NATURE OF IMPACT	DESCRIPTION OF IMPACT	SIGNIFICANCE POST-MITIGATION
	Spreading of alien invasive species and bush encroachment of indigenous species.	Very Low (-)
VISUAL	Visibility from sensitive receptors / visual scarring of the landscape as a result of the closure and rehabilitation activities.	Low (-)
	Visibility of solid domestic and operational waste.	Very Low (-)
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.	Very Low (-)
	Disturbance due to vibrations caused by heavy duty vehicles.	Very Low (-)
	Impact of security lighting on surrounding landowners and animals.	Very Low (-)
AIR QUALITY	Dust (soil and ore fines) pollution due to rehabilitation activities and heavy duty vehicles.	Very Low (-)
	Windborne dust (soil and ore fines) and vehicle fumes and particulate matter PM10, altering air quality.	Very Low (-)
WASTE	The activity in itself is associated with the miing activities that it will serve and therefore it will serve to contribute to the spread of waste from mining activities (however small or large the scale).	Low (-)
SERVICES	Need for additional services i.e. water, electricity and sewerage systems during the closure phase causing additional strain on natural resources and infrastructure.	Very Low (-)
TRAFFIC	The change in the traffic patterns on the surrounding road infrastructure and existing traffic.	Very Low (-)
	Nuisance, health and safety risks caused by increased traffic on and adjacent to the study area including cars and heavy vehicles.	Very Low (-)
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.	Very Low (-)
	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.	Very Low (-)
	Increased risk to public and worker health and safety.	Very Low (-)
SOCIO-ECONOMIC	Socio-economic impact on farmers, labourers and surrounding landowners and residents due to negative impacts on groundwater, dust pollution, noise pollution etc.	Low (-)
	Economic impact should there be an incident of public health and safety.	Very Low (-)
	Positive: Sourcing supplies from local residents and businesses boosting the local economy for an extended period of time.	Medium (+)
NO-GO ALTERNATIVE		
SOCIO-ECONOMIC	Reduced period of providing employment for local residents and skills transfer to unskilled and semi-skilled unemployed individuals.	Very Low (-)
	Reduced period of development and upliftment of the surrounding communities and infrastructure.	Very Low (-)

NATURE OF IMPACT	DESCRIPTION OF IMPACT	SIGNIFICANCE POST-MITIGATION
	Reduced period of development of the economic environment, by job provision and sourcing supplies for and from local residents and businesses.	Very Low (-)
GENERAL	Positive: No additional negative impacts on the environment.	High (+)

The impact assessment showed that the potential negative impacts resulting from the construction phase are generally low in significance before mitigation as the site has been previously disturbed by mining related activities.

After mitigation, most impacts have a very low or low significance. One positive impact with a low significance was identified i.e. the creation of short term employment opportunities.

During the operational phase, most negative impacts have a low significance before mitigation. After mitigation, most negative impacts will have a very low significance. Two positive socio-economic impacts have been identified, with a high significance i.e. long-term employment creation and one with a medium significance i.e. sourcing supplies from local and regional sources, boosting the economy in the region.

During the closure phase, most negative impacts will have the same significance rating before and after mitigation as for the operational phase.

(ii) Final Site Map

Provide a map at an appropriate scale which superimposes the proposed overall activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers.

Attach as Appendix 3

(iii) Summary of the positive and negative implications and risks of the proposed activity and identified alternatives;

All alternatives have been assessed and with the advantages and disadvantages of the various alternative options and preferred site layout option described. These positive and negative implications have been described in Table 6 of this report.

k) Proposed impact management objectives and the impact management outcomes for inclusion in the EMPr

(Based on the assessment and where applicable the recommendations from specialist reports, the recording of proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation).

The EMPr is compiled to provide recommendations and guidelines according to which compliance monitoring can be undertaken during all phases of the development, including the construction, operational and closure phases of the proposed community Waste Rock Beneficiation Facility, as well as to ensure that all relevant factors are considered to ensure an environmentally responsible development.

This EMPr informs all relevant parties (the Authority, the Applicant, the Site Manager, the Environmental Site Manager (ESM), the Environmental Control Officer (ECO) and all other staff employed on site), as to their duties in the fulfilment of the legal requirements for the operation of the community Waste Rock Beneficiation Facility, with particular relevance to the prevention and mitigation of anticipated potential environmental impacts.

All parties should note that obligations imposed by the EMPR are legally binding in terms of the environmental authorisation granted by the relevant environmental permitting authority.

The objectives of the EMPR are to:

- Ensure compliance with regulatory authority stipulations and guidelines which may be local, provincial, national and / or international;
- Ensure that there is sufficient allocation of resources on the project budget so that the scale of EMPR related activities (mitigation measures) are consistent with the significance of the project's impacts;
- Verify environmental performance through information on impacts as they occur;
- Respond to unforeseen events;
- Provide feedback for continual improvement in environmental performance;
- Identify a range of mitigation measures which could reduce and mitigate the potential impacts to minimal or an insignificant level;
- Detail specific actions deemed necessary to assist in mitigating the environmental impact of the project;
- Identify measures that could optimise beneficial impacts;
- Create management structures that addresses the concerns and complaints of the Interested and Affected Parties (I&APs) with regards to the development;
- Establish a method of monitoring and auditing environmental management practises during all phases of the activity;
- Ensure that safety recommendations are complied with; and
- Specific time periods within which the measures contemplated in the final EMPR should be implemented, where appropriate.

The point of departure for the EMPR is to ensure a proactive rather than a reactive approach to environmental performance by addressing potential problems before they occur. This will limit corrective measures needed. Therefore the purpose of an EMPR is to provide management measures that should be implemented by the Applicant, the Site Manager, the Environmental Site Manager (ESM), the Environmental Control Officer (ECO) and all other staff employed on site, to ensure that the potential impacts of a proposed development are minimised. It should also be ensured that the EMPr is maintained and upheld as a dynamic document in order for the project team to add or improve on issues that might be considered left out or not relevant to the project. In such instances the approving authority may authorise the ECO to make such changes.

l) Final proposed alternatives

(Provide an explanation for the final layout of the infrastructure and activities on the overall site as shown on the final site map together with the reasons why they are the final proposed alternatives which respond to the impact management measures, avoidance, and mitigation measures identified through the assessment).

Proposed alternatives were discussed in PART A Section 3 (g) (i) of this document, and the positive and negative impacts of the alternatives and preferred option are described and assessed in Tables 12 – 15 of this report. The preferred infrastructure option is shown on the mining section layouts included in Appendix 4.The process followed by the EAP to assess, minimise and avoid impacts is provided in Part A Section 3 (h) of this report.

m) Aspects for inclusion as conditions of Authorisation

(Any aspects which must be made conditions of the Environmental Authorisation)

Please refer to Part A, Section 3, p) ii) of this report.

n) Description of any assumptions, uncertainties and gaps in knowledge

(Which relate to the assessment and mitigation measures proposed).

- All information provided to the environmental team by the applicant and I&APs was correct and valid at the time that it was provided;
- The investigations undertaken by specialists during the BA process, indicate the development site as suitable and technically acceptable;
- It is not always possible to involve all I&APs individually however, every effort has been made to involve as many affected stakeholders as possible;
- The information provided by the applicant and specialists was accurate and unbiased; and
- The scope of this investigation is limited to assessing the environmental impacts associated with the construction, operation and closure phases of the proposed activity.

o) Reasoned opinion as to whether the proposed activity should or should not be authorised

(i) Reasons why the activity should be authorised or not

Based on the findings of the environmental impact assessment, the EAP is of the opinion that the proposed development be approved, due to the positive social and economic impacts for the local and regional communities that may occur as a result of the community Waste Rock Beneficiation Facility. The potential negative impacts can be mitigated to acceptable levels, provided that the mitigation measures are strictly implemented and monitored.

In general, it is recognised that the proposed facility associated with the Samancor Chrome Millsell mine has the potential to pose various risks to the environment as well as to the residents or businesses in the surrounding area. However, based on the findings of this EIA documented in this report, all impacts can be mitigated to acceptable levels. Furthermore, the proposed activities will be located on previously disturbed land.

This report shows that the proposed development has the potential to provide many socio-economic benefits to the local and regional communities. The EAP therefore recommends that the proposed activities be approved on condition that the EMPR is strictly implemented and monitored for compliance. Should the activities not be approved, resources will not be utilised to its full economic potential, losing the ability of the mine to provide socio-economic benefits to the local and regional communities and the country as a whole.

(ii) Conditions that must be included in the authorisation

(1) Specific conditions to be included into the compilation and approval of EMPR

- The EMPR is a contractual document and must be implemented at the Samancor Chrome Millsell mine at all times;
- An independent environmental control officer (ECO) must be appointed to monitor the implementation of the EMPR and audit reports kept by the applicant;
- All contractors and employees of Samancor Chrome, must be made aware of the EMPR and its requirements as well as the impact of not implementing the measures of the EMPR;
- Copies of the EMPR, Environmental Authorisation, Mining Right and Waste Management License, as well as the Water Use License and any emergency procedures and method statements, must be kept on site and be available on request of the Competent Authority.

(2) Rehabilitation requirements

Mineral right holders (Holders) are currently required to comply with the financial provision requirements under the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA). In November 2015 new Financial Provision for Prospecting, Exploration, Mining or Production Operations Regulations, November 2015 (GNR 1147) were promulgated in terms of NEMA, regulations.

The requirements for a final rehabilitation, decommissioning and mine closure plan, are outlined in the Regulations (GNR 1147) are to identify a post mining land use that is feasible through the following:

(a) Providing the vision, objectives, targets and criteria for final rehabilitation, decommissioning and closure of the project;
(b) Outlining the design principles for closure;
(c) Explaining the risk assessment approach and outcomes and link closure activities to risk rehabilitation;
(d) Detailing the closure actions that clearly indicate the measures that will be taken to mitigate and/or manage identified risks and describes the nature of residual risks that will need to be monitored and managed post closure;
(e) Committing to a schedule, budget, roles and responsibilities for final rehabilitation, decommissioning and closure of each relevant activity or item of infrastructure;
(f) Identifying knowledge gaps and how these will be addressed and filled;
(g) Detailing the full closure costs for the life of project at increasing levels of accuracy as the project develops and approaches closure in line with the final land use proposed; and
(h) Outlining, monitoring, auditing and reporting requirements.

p) Period for which the Environmental Authorisation is required.

The authorisation for the Millsell mine community Waste Rock Beneficiation Facility is required for 10 years (2018 to 2028).

q) Undertaking

(Confirm that the undertaking required to meet the requirements of this section is provided at the end of the EMPr and is applicable to both the Basic Assessment Report and the Environmental Management Programme Report).

The undertaking required in terms of this report is provided in the EMPR in Part B Section 2 of this document and is applicable to both the Basic Assessment Report (Part A) and the Environmental Management Programme report (Part B).

r) Financial Provision

(State the amount that is required to both manage and rehabilitate the environment in respect of rehabilitation).

The Financial Provision report and relevant information will be included in the Final Basic Assessment Report to be submitted to the Department for a decision.

(i) Explain how the aforesaid amount was derived

The financial provision amount is calculated utilising the methodology as prescribed by the Guideline Documents for the Evaluation of the Quantum of Closure Related Financial Provision Provided by a Mine issued by the DMR.

ii) Confirm that this amount can be provided for from operating expenditure.

(Confirm that the amount, is anticipated to be an operating cost and is provided for as such in the Mining work programme, Financial and Technical Competence Report or Prospecting Work Programme as the case may be).

It is confirmed that the amount for financial provision is anticipated to be an operating cost and is provided for as such in the Mine Works Programme for the Samancor Mines.

s) Specific Information required by the competent Authority

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

(1) Impact on the socio-economic conditions of any directly affected person.

(Provide the results of Investigation, assessment, and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any directly affected person including the landowner, lawful occupier, or, where applicable, potential beneficiaries of any land restitution claim, attach the investigation report as Appendix 2.19.1 and confirm that the applicable mitigation is reflected in 2.5.3; 2.11.6.and 2.12. herein).

The proposed activities will be undertaken on land owned by Samancor Chrome Limited and is also the occupier of the land and therefore will have no direct impacts on the socio-economic conditions of any directly affected persons. There are also no land restitution claims on the properties where the existing and proposed activities applied for are and will be located.

(2) Impact on any national estate referred to in section 3(2) of the National Heritage Resources Act

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

No heritage sites or objects was observed by the specialist on the site where the development is proposed.

t) Other matters required in terms of sections 24 (4) (a) and (b) of the Act

(the EAP managing the application must provide the competent authority with detailed, written proof of an investigation as required by section 24(4)(b)(i) of the Act and motivation if no reasonable or feasible alternatives, as contemplated in sub-regulation 22(2)(h), exist. The EAP must attach such motivation as Appendix 4).

Not applicable to this application. Please refer to Section 8 of this Basic Assessment Report for a description and analysis of alternatives considered as part of this application.

PART B

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

1) Draft environmental management programme.

a) Details of the EAP

(Confirm that the requirement for the provision of the details and expertise of the EAP are already included in PART A, section 1(a) herein as required).

Please refer to Part A Section 3 a) i) and ii).

b) Description of the Aspects of the Activity

(Confirm that the requirement to describe the aspects of the activity that are covered by the draft environmental management programme is already included in PART A, section (1) (h) herein as required).

Please refer to Part A Section 3 b) and d).

c) Composite Map

(Provide a map (Attached as an Appendix) at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that any areas that should be avoided, including buffers)

The composite map is included as Appendix 3.

d) Description of Impact management objectives including management statements

i) Determination of closure objectives.

(Ensure that the closure objectives are informed by the type of environment described in 2.4 herein)

The closure objectives in the existing EMPR for the Samancor Millsell / Waterkloof Mine, will be applicable to the proposed Community Waste Rock Beneficiation Facility. These include:

Management objectives

The objective for closure of the mining section is to create a free draining post mining landscape that has been returned to a productive post mining land use. The land use is likely to be primarily wilderness with the potential for arable agriculture and livestock grazing.

No new fixed infrastructure will be established on closure and all existing infrastructure will be removed. The closure objective regarding groundwater is zero discharge of contaminated water to the environment.

Management measures

The broad approach to the closure of the site is detailed in the existing approved environmental management programme. Samancor (WCM) Millsell - Waterkloof Section will develop a detailed closure plan at least two years before cessation of mining detailing how they plan to finalise closure of the site.

ii) Volumes and rate of water use required for the operation.

The volumes and rate of water use will not increase from the existing volumes and rate of water use as a result of the proposed Community Waste Rock Beneficiation Facility.

iii) Has a water use licence has been applied for?

Yes, the Water Use Licence Application (WULA) was submitted to the Department of water and Sanitation (Hartbeespoort Region) on 2 February 2016. The reference number is: 27/2/2/A822/12/1.

Please find the proof of submission attached in Appendix 10.

iv) Impacts to be mitigated in their respective phases

Table 22: Measures to rehabilitate the environment affected by the undertaking of any listed activity

ACTIVITIES	PHASE	SIZE AND SCALE of disturbance	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
Construction of crusher, screen, conveyors, cleaning magnet, and transfer chute	Construction Phase	Extent of new infrastructure on total area allocated of 24 841 m^2	**Prevent and reduce and remedy the contamination of soil and water as well as ensure the safety of people through management measures.** • All vehicles and machinery will be regularly serviced to ensure they are in proper working condition and to reduce risk of leaks; • All leaks will be cleaned up immediately using an absorbent material and spill kits, in the prescribed manner; and • The approved Integrated Water and Waste Management Plan to be implemented. ***Hydrocarbons and hazardous waste*** • All hazardous waste generated shall be kept separate and shall not be mixed with general waste; and • All hazardous waste shall be stored within a sealed drum on an impermeable surfaced area within the central waste storage and transition area. **Protect heritage resources:** • Should culturally significant material or skeletal remains be exposed during development and construction phases, all activities must be suspended pending further investigation by a qualified archaeologist (Refer to the National Heritage and Resources Act, 25 of 1999 section 36 (6)); • Should any objects of archaeological or palaeontological remains be found during construction activities, work must immediately stop in that area and the Environmental Control Officer (ECO) must be informed; • The ECO must inform SAHRA and contact an archaeologist and / or palaeontologist, depending on the nature of the find, to	Rehabilitation objectivesnand standards Spill procedure Approved IWWMP Hazardous Substances Act, 1973 (Act 15 of 1973) [as amended] • Section 2 Declaration of grouped hazardous substances; • Section 9 (1) Storage and handling of hazardous chemical substances • Section 18 Offences Hazardous Chemical Substances Regulations, 1995 (Government Notice 1179 of 1995) • Section 4 Duties of persons who may be exposed to hazardous chemical substances	During site clearance and the installation of crushers, screens, conveyors, cleaning magnet and transfer chute.

ACTIVITIES	PHASE	SIZE AND SCALE of disturbance	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			assess the importance and rescue them if necessary (with the relevant SAHRA permit). No work may be resumed in this area without the permission of the ECO and SAHRA; and • If the newly discovered heritage resource is considered significant, a Phase 2 assessment may be required. A permit from the responsible authority will be required.	SANS 10234: 2008: Globally Harmonized System of classification and labelling of chemicals (GHS)	
			Prevent and reduce and remedy soil compaction through management measures. • Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants; and • Soils compacted, should be deeply ripped at least to a depth of 300mm to loosen compacted layers and re-graded to even running levels.	Rehabilitation objectives and standards	During the installation of crushers, screens, conveyors, cleaning magnet and transfer chute.
			Prevent and reduce and remedy siltation through management measures. • The Site Manager (SM) should ensure that excessive quantities of sand, silt and silt-laden water do not enter the stormwater system; • Appropriate measures, e.g. construction of silt traps, or drainage retention areas to prevent silt and sand entering drainage or should be taken; • No wastewater may run freely into any of the surrounding naturally vegetated areas; • The loss of topsoil must be minimised; • Erosion and subsequent siltation must be limited; • Any drainage channels shall be suitably designed to ensure that erosion does not occur; • All areas susceptible to erosion shall be protected and stabilisation measures implemented:	Rehabilitation objectives and standard Approved IWWMP Approved Stormwater Management Plan GN704 Regulations in terms of the National Water Act, 1998 (Act No 36 of 1998)	During the installation of crushers, screens, conveyors, cleaning magnet and transfer chute.

ACTIVITIES	PHASE	SIZE AND SCALE of disturbance	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			• Packing of sandbags, gabions, straw bales or brush to reduce the speed of water flow where water is scouring the topsoil and results in the formation of erosion gullies; • Any surface runoff generated which has a high suspended solid content shall be collected at the point source in an appropriate containment facility, then be allowed to settle before being discharged into the environment; and • A stormwater management plan must be compiled, and should be approved by DWS and implemented.		
			Prevent and reduce water and soil pollution through management measures. In accordance with Government Notice 704 (GN 704), the onsite management should: • Keep clean and dirty water separated; • Contain any dirty water within a system; and • Prevent the contamination of clean water. In order to achieve these objectives, the following stormwater management measures must be implemented on the site to ensure that that potential stormwater impacts are kept to a minimum: • Clean and dirty stormwater needs to be separated. Dirty stormwater may not be released into the environment and should be contained and treated on site; • All temporary storm water infrastructure (if any) on-site shall be maintained and kept clean throughout the construction period; • Immediate reporting of any polluting or potentially polluting incidents so that appropriate measures can be implemented; • Fuel and oil spills shall be treated immediately by appropriate mop-up products. Several hydrocarbon absorption/remediation products (i.e. Spill kits) must be placed throughout the site. The approved spill procedure to be implemented;	Rehabilitation objectives and standard Spill Procedure Approved IWWMP Approved Stormwater Management Plan GN704 Regulations in terms of the National Water Act, 1998 (Act No 36 of 1998)	During the installation of crushers, screens, conveyors, cleaning magnet and transfer chute.

ACTIVITIES	PHASE	SIZE AND SCALE of disturbance	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			• Use of bunds or traps to ensure full containment of hydrocarbon and other hazardous materials are mandatory; • Any contaminated material is disposed of in an appropriate manner and the potential risks associated with such spills are limited; • Stormwater leaving the site must in no way be contaminated; • Increased runoff should be managed using berms and other suitable structures as required to ensure flow velocities are reduced; and • Removal of spills, rainwater and waste produced during clean-up of the bunds – shall be done in accordance to relevant specifications; • Ensure good housekeeping practices.		
			Reduce loss of vegetation and fauna through management measures. • Any sensitive herpetofauna inadvertently killed during earth moving activities, should be preserved as museum voucher specimens; • Any stormwater cut-off channels should be kept as natural as possible with gentle slopes (45° angle or less) on the side away from mining activities. Channels should also have rough surfaces and rocks, less "curvature" on the walls to enable smaller animals to escape. A "step" in the slope of the walls and a "lip" on the edge of the channel will deter animals from entering the channels; • Only vegetation falling directly in demarcated access routes or project sites should be removed where necessary; • No further vegetation clearance except for the removal of alien invasive species will be allowed; and • All remaining indigenous vegetation should be conserved wherever possible.	Alien and Invasive Species Management Plan Rehabilitation Objectives and Standards 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 2014)	During the installation of crushers, screens, conveyors, cleaning magnet and transfer chute.

ACTIVITIES	PHASE	SIZE AND SCALE of disturbance	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			Prevent and control alien vegetation from spreading through management measures. • An alien vegetation management plan should be compiled and implemented; • Regular removal of invasive alien species should be undertaken. This should extend right through to the closure phase of the project; and • No spread of alien vegetation onto adjacent properties should be allowed.	Alien and Invasive Species Management Plan Rehabilitation Objectives and Standards 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 2014)	During the installation of crushers, screens, conveyors, cleaning magnet and transfer chute.
			Conserve and / or restore migratory routes of fauna through management measures. Reduce the levels of disturbance on areas indicated by the Environmental Control Officer (ECO) as migratory routes, if any.	Rehabilitation objectives and standards	During the installation of crushers, screens, conveyors, cleaning magnet and transfer chute.
			Reduce disturbance and loss of fauna through controlling measures. • Environmental awareness training should include that no hunting, trapping or killing of fauna are allowed; • Any animals rescued or recovered will be relocated in suitable habitat away from the mining operations and associated infrastructure; • Any lizards, snakes or monitors encountered should be allowed to escape to suitable habitat away from disturbance. • No reptile should be intentionally killed, caught or collected during any phase of the project; and • General avoidance of snakes is the best policy if encountered. Snakes should not be intentionally harmed or killed and allowed free movement away from the area.	Rehabilitation objectives and standards	During the installation of crushers, screens, conveyors, cleaning magnet and transfer chute.
			Reduce visual impact through controlling management measures. • Housekeeping on site should be enforced;	-	During the installation of crushers, screens, conveyors, cleaning

ACTIVITIES	PHASE	SIZE AND SCALE of disturbance	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			• Rehabilitation measures such as re-vegetation and plan to be implemented; • Install lights that will not create a night sky glow; • Reduce the construction period through careful planning and productive implementation of resources; • Plan the placement of lay-down areas and any potential temporary construction camps in order to minimise vegetation clearing; • Restrict the activities and movement of construction workers and vehicles to the immediate construction site and existing access roads; • Ensure that rubble, litter and issued construction materials are managed and removed regularly; • Ensure that all infrastructure and the site and general surrounds are maintained in a neat and appealing way; and • Reduce and control construction dust through the use of approved dust suppression techniques.		magnet and transfer chute.
			Reduce noise disturbance/ increased level of noise through controlling measures. • Vehicles will be regularly serviced to ensure acceptable noise levels are not exceeded. Silencers will be utilised where possible; • Heavy vehicle traffic should be routed away from noise sensitive areas where possible; • Noise levels should be kept within acceptable limits. All noise and sounds generated should adhere to South African Bureau of Standards (SABS) specifications for maximum allowable noise levels for construction sites. No pure tone sirens or hooters may be utilised except where required in terms of SABS standards or in emergencies; • With regard to unavoidable very noisy construction activities in the vicinity of noise sensitive areas, the Site Manager (SM) should liaise with local residents and how best to minimise	The South African National Standard SANS 10103:2008	During the installation of crushers, screens, conveyors, cleaning magnet and transfer chute.

ACTIVITIES	PHASE	SIZE AND SCALE of disturbance	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			impacts, and the local population should be kept informed of the nature and duration of intended activities; • The SM should take measures to discourage labourers from loitering in the area, causing noise disturbance; • Noise impacts should be minimised by restricting the hours (between 06h00 and 18h00 on Monday to Friday, and 06h00 and 13h00 on Saturdays), during which the offending activities are carried out and, where possible, by insulating machinery and/or enclosing areas of activity; • Should any complaints be received, noise monitoring should be conducted and specialist recommendations implemented where possible; • Personal Protective Equipment to all persons working in areas where high levels of noise can be expected; Signs where it is compulsory; • Proper design of the plant areas and machinery where measures are taken to prevent noise generation such as silencers, mufflers and sound suppressing enclosures for parts/processes which can generate noise; • Regular inspections and maintenance of equipment, vehicles and machinery to prevent unnecessary noise; • Noise breaking barriers can be erected such as netting, walls or high growing trees; and • Placement of noise generating activities can be planned as far away as possible from affected areas or persons.		
			Reduce light pollution through controlling measures. • Unnecessary lights should be switched off during the day and / or night to avoid light pollution; • Install lights that will not create a night sky glow; • If lighting is required, the lighting will be located in such a place and such a manner so as to minimise any impact on the surrounding community; and	-	During the installation of crushers, screens, conveyors, cleaning magnet and transfer chute.

ACTIVITIES	PHASE	SIZE AND SCALE of disturbance	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			• Security lighting should be designed in such a way as to minimise emissions onto undisturbed areas on site and neighbouring properties. Light fittings should face downwards.		
			Reduce air and dust pollution through controlling measures. • Dust suppression shall be implemented during dry periods and windy conditions; • All exposed surfaces should be minimised in terms of duration of exposure to wind and stormwater; • Excavation, handling and transportation of erodible materials shall be avoided under high wind conditions (excess of 35km/hr) / when visible dust plume is present; • Ensure that shortest routes are used for material transport; • Ensure that stockpile height is kept to a minimum and that any stockpiling occurs downwind of the stockpiles; • Minimise travel speed on paved roads (30 km/h); • Should any complaints be received, additional dust monitoring should be implemented for the waste rock beneficiation facility; • Implement monthly site inspection to check for possible areas of dust generation not addressed or not effectively managed; • Spray areas to be cleared with water. • Ensure minimum travel distance between working areas and stockpiles. • Ensure that topsoil for stockpiles is sprayed with water before tipping to prevent dust generation. • Ensure graded areas are sprayed with water. • Minimise the amount of graded areas. • Load and offload material, as far as possible, downwind of stockpiles.	South Africa National Standard 1929:2005: Ambient Air Quality: Limits for common pollution National Dust Control regulations, 2013, as published in the Government Gazette (No. 36974) of 1 November 2013 (GNR 827 of 1 November 2013), in terms of the National Environmental Management: Air Quality Act 39 of 2004 Approved dust fall monitoring programme	During the installation of crushers, screens, conveyors, cleaning magnet and transfer chute.
			Control waste through management measures. • The conditions of the Integrated Water Use License (IWUL) and the IWWMP must be implemented.	Approved IWWMP Waste Classification and Management Regulations and Norms	During the installation of crushers, screens, conveyors, cleaning

ACTIVITIES	PHASE	SIZE AND SCALE of disturbance	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			• A central waste storage and transition area shall be established within the site camp; • The central waste storage and transition area shall be surfaced and demarcated appropriately; • Portable wheelie bins shall be placed throughout the site camp as well as at the remainder of the site and at all working areas in the field; • Wheelie bins shall be colour coded and labelled to identify the waste stream for which it is intended; • All portable wheelie bins and other containers shall be emptied at the central waste storage and transition area a minimum of once a week as to avoid waste build up; • The waste shall be removed (within 30 days) by a licensed waste service provider as shall be disposed of at a licensed waste landfill site and records of safe disposal (as required for hazardous wastes) shall be supplied to the Millsell operations. These records shall be kept on site by the ESM. • Wherever possible and practical, waste materials generated on site must be recycled.	and Standards for the assessment of for landfill disposal and for disposal of waste to landfill, 2013 (Government Notice 634 – 635 of 2013) promulgated in terms of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) [as amended] and: SANS 10234: 2008: Globally Harmonized System of classification and labelling of chemicals (GHS)	magnet and transfer chute.
			Reduce use of natural resources through controlling management measures. • Energy savings measures to be implemented at the mine, e.g.: ➢ No lights to be switched on unnecessarily. Only security lights to be switched on at night; • Energy saving bulbs to be installed; and • Water should be recycled as far as possible to avoid any additional water usage.	-	During the installation of crushers, screens, conveyors, cleaning magnet and transfer chute.
			Reduce change in traffic patterns through controlling management measures. • Where feasible heavy vehicles should not operate on public roads during peak hours; and • Heavy vehicles should adhere to the speed limit of the road.	Legal speed limits South African Road Signs Manual	During the installation of crushers, screens, conveyors, cleaning magnet and transfer chute.

ACTIVITIES	PHASE	SIZE AND SCALE of disturbance	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			Prevent accidents through controlling management measures. • Drivers will be enforced to keep to set speed limits. • Trucks will be in a road-worthy condition. • Roads and intersections will be signposted clearly. Only main roads should be used; • Where feasible vehicles should not operate on public roads during peak hours; • Heavy vehicles should always travel with their head lights switched on; • Heavy vehicles should not stop on the road to pick up hitchhikers – No stopping on the road approaching the mine will be allowed; • Single directional traffic shall be controlled through a stop-go system or any other appropriate traffic control method; • Samancor shall be responsible for ensuring that suitable access is maintained for public traffic to all relevant businesses and properties; and • All traffic accommodation measures are to conform to the latest edition of the South African Road Signs Manual.	Legal speed limits South African Road Signs Manual	During the installation of crushers, screens, conveyors, cleaning magnet and transfer chute.
			Prevent fire through controlling management measures. • All workers will be sensitised to the risk of fire; • Smoking is only allowed in designated smoking areas and dispose of cigarette butts safely in sand buckets; • The Applicant shall ensure that the basic fire-fighting equipment is available on the site; • Extinguishers should be located outside hazardous materials and chemicals storage containers; Fire response and evacuation • An Emergency Plan (including Fire Protection, Response and Evacuation Plan) is to be prepared by the Applicant and conveyed to all staff on the site;	An Emergency Plan (including Fire Protection, Response and Evacuation Plan) Veld and Forest Fire Act, 1998 (Act No. 101 of 1998) [as amended] • Section 12 (1) Duty of the landowner to prevent fire from spreading to neighbouring properties.	During the installation of crushers, screens, conveyors, cleaning magnet and transfer chute.

ACTIVITIES	PHASE	SIZE AND SCALE of disturbance	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			• Identify major risks to minimise the environmental impacts e.g., air pollution and contaminated effluent runoff.		
			Prevent health and safety incidents through controlling management measures. • A health and safety plan in terms of the Mine Health and Safety Act (Act 29 of 1996) should be compiled and implemented to ensure worker safety; • A health and safety control officer should monitor the implementation of the health and safety plan for the operational phase; • Regular health and safety audits should be conducted and documented; and a record of health and safety incidents should be kept on site and made available for inspection; • Any health and safety incidents should be reported to the Site Manager (SM) immediately; • First aid facilities should be available on site at all times; • Workers have the right to refuse work in unsafe conditions; • Material stockpiles or stacks should be stable and well secured to avoid collapse and possible injury to site workers. • Access to excavation must be controlled; • Excavated areas should be temporarily fenced-off; and • Excavations, such as pipeline excavations, will be backfilled and landscaped as soon as possible.	Health and safety plan in terms of the Mine Health and Safety Act (Act 29 of 1996	During the installation of crushers, screens, conveyors, cleaning magnet and transfer chute.
Stockpiling of raw material Operation of crusher, screen, conveyors, cleaning magnet, and transfer chute	Operational	Extent of new infrastructure on total area allocated of 24 841 m^2	**Reduce and remedy soil compaction and degradation through controlling management measures.** • The approved stormwater management plan must be implemented; • Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants; and • Soils compacted, should be deeply ripped at least to a depth of 300mm to loosen compacted layers and re-graded to even running levels.	Rehabilitation Objectives and Standards	Throughout the plant operational phase

ACTIVITIES	PHASE	SIZE AND SCALE of disturbance	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
Stockpiling of product (Ready-mix concrete, Pre-bagged products, Stope support systems for the mining industry, Precast walling, Kerbs and edging)			**Prevent soil and water pollution through controlling management measures.** • Groundwater monitoring quarterly and surface water monitoring monthly as is currently practiced by Millsell; • Develop a groundwater flow model for the site to simulate groundwater flow and predict contaminant migration; • All vehicles and machinery will be regularly serviced to ensure they are in proper working condition and to reduce risk of leaks; • All leaks will be cleaned up immediately using an absorbent material and spill kits, in the prescribed manner; and • The approved Integrated Water and Waste Management Plan to be implemented. ***Hydrocarbons and hazardous waste*** • All hazardous waste generated shall be kept separate and shall not be mixed with general waste; and • All hazardous waste shall be stored within a sealed drum on an impermeable surfaced area within the central waste storage and transition area.	Rehabilitation objectives and standards Spill procedure Approved IWWMP Hazardous Substances Act, 1973 (Act 15 of 1973) [as amended] Section 2 Declaration of grouped hazardous substances; • Section 9 (1) Storage and handling of hazardous chemical substances • Section 18 Offences Hazardous Chemical Substances Regulations, 1995 (Government Notice 1179 of 1995). • Section 4 Duties of persons who may be exposed to hazardous chemical substances. SANS 10234: 2008: Globally Harmonized System of classification and labelling of chemicals (GHS)	Throughout the plant operational phase
			Prevent and reduce and remedy siltation through management measures. • The Site Manager (SM) should ensure that excessive quantities of sand, silt and silt-laden water do not enter the stormwater system;	Rehabilitation objectives and standard Approved IWWMP	Throughout the plant operational phase

ACTIVITIES	PHASE	SIZE AND SCALE of disturbance	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			• Appropriate measures, e.g. construction of silt traps, or drainage retention areas to prevent silt and sand entering drainage or should be taken; • No wastewater may run freely into any of the surrounding naturally vegetated areas; • Erosion and subsequent siltation must be limited; • Any drainage channels shall be suitably designed to ensure that erosion does not occur; • All areas susceptible to erosion shall be protected and stabilisation measures implemented: • Packing of sandbags, gabions, straw bales or brush to reduce the speed of water flow where water is scouring the topsoil and results in the formation of erosion gullies; • Any surface runoff generated which has a high suspended solid content shall be collected at the point source in an appropriate containment facility, then be allowed to settle before being discharged into the environment; and • A stormwater management plan must be compiled, and should be approved by DWS and implemented.	Approved Stormwater Management Plan GN704 Regulations in terms of the National Water Act, 1998 (Act No 36 of 1998)	
			Prevent and reduce water and soil pollution through management measures. In accordance with Government Notice 704 (GN 704), the onsite management should: • Keep clean and dirty water separated; • Contain any dirty water within a system; and • Prevent the contamination of clean water. In order to achieve these objectives, the following stormwater management measures must be implemented on the site to ensure that that potential stormwater impacts are kept to a minimum:	Rehabilitation objectives and standard Spill Procedure Approved IWWMP Approved Stormwater Management Plan GN704 Regulations in terms of the National Water Act, 1998 (Act No 36 of 1998)	Throughout the plant operational phase

ACTIVITIES	PHASE	SIZE AND SCALE of disturbance	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			• Clean and dirty stormwater needs to be separated. Dirty stormwater may not be released into the environment and should be contained and treated on site; • The operation and maintenance of the stormwater and waste water containment facilities shall be done in accordance with the requirements of the Integrated Water Use License and Integrated Water and Waste Management Plan (IWWMP); • Immediate reporting of any polluting or potentially polluting incidents so that appropriate measures can be implemented; • Fuel and oil spills shall be treated immediately by appropriate mop-up products. Several hydrocarbon absorption/remediation products (i.e. Spill kits) must be placed throughout the site. The approved spill procedure to be implemented; • Use of bunds or traps to ensure full containment of hydrocarbon and other hazardous materials are mandatory; • Any contaminated material is disposed of in an appropriate manner and the potential risks associated with such spills are limited; • Stormwater leaving the site must in no way be contaminated by any substance, whether such substance is a solid, liquid, vapour or gas or a combination thereof which is produced, used, stored, dumped or spilled on the premises; • All hazardous substances should be stored on impervious surfaces that allow for the containment of spills and leakages (e.g. bunded areas). Should spills occur, these should be reported to the Site Manager. • Liquid hazardous waste shall be contained and stored according to the prescribed measures; • Increased runoff should be managed using berms and other suitable structures as required to ensure flow velocities are reduced; and		

ACTIVITIES	PHASE	SIZE AND SCALE of disturbance	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			• Removal of spills, rainwater and waste produced during clean-up of the bunds – shall be done in accordance to relevant specifications; • Ensure good housekeeping practices.		
			Reduce loss of vegetation and fauna through management measures. • Should the Southern African Python, Giant Bullfrogs or herpetological species be found, these should be relocated to a natural area. This is to be done by a suitably qualified herpetologist; • Environmental awareness training should include that no hunting, trapping or killing of fauna are allowed; • Any animals rescued or recovered will be relocated in suitable habitat away from the mining operations and associated infrastructure; • Any lizards, snakes or monitors encountered should be allowed to escape to suitable habitat away from disturbance. • No reptile should be intentionally killed, caught or collected during any phase of the project; and • General avoidance of snakes is the best policy if encountered. Snakes should not be intentionally harmed or killed and allowed free movement away from the area. • Any sensitive herpetofauna inadvertently killed during earth moving activities, should be preserved as museum voucher specimens; • Any stormwater cut-off channels should be kept as natural as possible with gentle slopes (45° angle or less) on the side away from mining activities. Channels should also have rough surfaces and rocks, less "curvature" on the walls to enable smaller animals to escape. A "step" in the slope of the walls and a "lip" on the edge of the channel will deter animals from entering the channels;	Alien and Invasive Species Management Plan Rehabilitation Objectives and Standards Alien and Invasive Species Regulations (Government Notice 598 of 2014) and Alien and Invasive Species List, 2014 in terms of NEMBA (Government Notice 599 of 2014) • Notice 2 Exempted Alien Species in terms of Section 66 (1) • Notice 3 National Lists of Invasive Species in terms of Section 70(1) – List 1, 3-9 & 11 • Notice 4 Prohibited Alien Species in terms of Section 67 (1) – List 1, 3-7, 9-10 & 12 Environmental Awareness Plan	Throughout the plant operational phase

ACTIVITIES	PHASE	SIZE AND SCALE of disturbance	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			• Only vegetation falling directly in demarcated access routes or project sites should be removed where necessary; • No further vegetation clearance except for the removal of alien invasive species will be allowed; and • All remaining indigenous vegetation should be conserved wherever possible.		
			Prevent and control alien vegetation from spreading through management measures. • An alien vegetation management plan should be compiled and implemented; • Regular removal of invasive alien species should be undertaken. This should extend right through to the closure phase of the project; and • No spread of alien vegetation onto adjacent properties should be allowed.	Alien and Invasive Species Management Plan Rehabilitation Objectives and Standards 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 2014)	Throughout the plant operational phase
			Conserve and / or restore migratory routes of fauna through management measures. Reduce the levels of disturbance on areas indicated by the Environmental Control Officer (ECO) as migratory routes, if any.	Rehabilitation objectives and standards	Throughout the plant operational phase
			Reduce visual impact through controlling management measures. • Housekeeping on site should be enforced; • Install lights that will not create a night sky glow; • Restrict the activities and movement of workers and vehicles to the immediate site and existing access roads; • Ensure that waste materials are managed and removed regularly; • Ensure that all infrastructure and the site and general surrounds are maintained in a neat and appealing way; and • Reduce and control dust through the use of approved dust suppression techniques.	Visual Impact Assessment Mitigation Measures and Recommendations	Throughout the plant operational phase

ACTIVITIES	PHASE	SIZE AND SCALE of disturbance	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			Reduce noise disturbance/ increased level of noise through controlling measures. • Silencers will be utilised where possible; • Heavy vehicle traffic should be routed away from noise sensitive areas where possible; • Noise levels should be kept within acceptable limits. All noise and sounds generated should adhere to South African Bureau of Standards (SABS) specifications for maximum allowable noise levels for construction sites. No pure tone sirens or hooters may be utilised except where required in terms of SABS standards or in emergencies; • With regard to unavoidable very noisy construction activities in the vicinity of noise sensitive areas, the Site Manager (SM) should liaise with local residents and how best to minimise impacts, and the local population should be kept informed of the nature and duration of intended activities; • The SM should take measures to discourage labourers from loitering in the area, causing noise disturbance; • Noise impacts should be minimised by restricting the hours (between 06h00 and 18h00 on Monday to Friday, and 06h00 and 13h00 on Saturdays), during which the offending activities are carried out and, where possible, by insulating machinery and/or enclosing areas of activity; • Should any complaints be received, noise monitoring should be conducted and specialist recommendations implemented where possible; • Personal Protective Equipment to all persons working in areas where high levels of noise can be expected; Signs where it is compulsory; • Proper design of the plant areas and machinery where measures are taken to prevent noise generation such as silencers, mufflers	The South African National Standard SANS 10103:2008 Mine Health and Safety Act (Act 29 of 1996)	Throughout the plant operational phase

ACTIVITIES	PHASE	SIZE AND SCALE of disturbance	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			and sound suppressing enclosures for parts/processes which can generate noise; • Regular inspections and maintenance of equipment, vehicles and machinery to prevent unnecessary noise; • Noise breaking barriers can be erected such as netting, walls or high growing trees; and • Placement of noise generating activities can be planned as far away as possible from affected areas or persons.		
			Reduce light pollution through controlling measures. • Unnecessary lights should be switched off during the day and / or night to avoid light pollution; • Install lights that will not create a night sky glow; • Mitigation of lighting impacts includes the pro-active design, planning and specification lighting for the facility by a lighting engineer; • Shielding the sources of light by physical barriers (vegetation, or the structure itself); • Limiting mounting heights of lighting fixtures by specifying foot-lights or bollard level lights; • Making use of minimum lumen or wattage in fixtures; • Making use of down-lighters or shielded fixtures; • Making use of energy efficient lighting or other types of low impact lighting. • If lighting is required, the lighting will be located in such a place and such a manner so as to minimise any impact on the surrounding community; and • Security lighting should be designed in such a way as to minimise emissions onto undisturbed areas on site and neighbouring properties. Light fittings should face downwards.	Visual Impact Assessment Mitigation Measures and Recommendations	Throughout the plant operational phase
			Reduce air and dust pollution through controlling measures. • Dust suppression shall be implemented during dry periods and windy conditions;	South Africa National Standard 1929:2005: Ambient Air Quality: Limits for common pollution	Throughout the plant operational phase

ACTIVITIES	PHASE	SIZE AND SCALE of disturbance	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			• Ensure that shortest routes are used for material transport; • Ensure that stockpile height is kept to a minimum and that any stockpiling occurs downwind of the stockpiles; • Minimise travel speed on paved roads (30 km/h); • Should any complaints be received, additional dust monitoring should be implemented for the waste rock beneficiation facility; • Implement monthly site inspection to check for possible areas of dust generation not addressed or not effectively managed; • Ensure minimum travel distance between working areas and stockpiles. • Ensure graded areas are sprayed with water. • Minimise the amount of graded areas. • Load and offload material, as far as possible, downwind of stockpiles.	National Dust Control regulations, 2013, as published in the Government Gazette (No. 36974) of 1 November 2013 (GNR 827 of 1 November 2013), in terms of the National Environmental Management: Air Quality Act 39 of 2004 Approved dust fall monitoring programme	
			Control waste through management measures. • The conditions of the Integrated Water Use License (IWUL) and the IWWMP must be implemented. • A central waste storage and transition area shall be established within the site; • The central waste storage and transition area shall be surfaced and demarcated appropriately; • Portable wheelie bins shall be placed throughout the site camp as well as at the remainder of the site and at all working areas; • Wheelie bins shall be colour coded and labelled to identify the waste stream for which it is intended; • All portable wheelie bins and other containers shall be emptied at the central waste storage and transition area a minimum of once a week as to avoid waste build up; • The waste shall be removed (within 30 days) by a licensed waste service provider as shall be disposed of at a licensed waste landfill site and records of safe disposal (as required for	Approved IWWMP Waste Classification and Management Regulations and Norms and Standards for the assessment of for landfill disposal and for disposal of waste to landfill, 2013 (Government Notice 634 – 635 of 2013) promulgated in terms of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) [as amended] and: SANS 10234: 2008: Globally Harmonized System of classification and labelling of chemicals (GHS)	Throughout the plant operational phase

ACTIVITIES	PHASE	SIZE AND SCALE of disturbance	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			hazardous wastes) shall be supplied to the Millsell operations. These records shall be kept on site by the ESM. • Wherever possible and practical, waste materials generated on site must be recycled.		
			Reduce use of natural resources through controlling management measures. • Energy savings measures to be implemented at the mine, e.g.: ➢ No lights to be switched on unnecessarily. Only security lights to be switched on at night; • Energy saving bulbs to be installed; and • Water should be recycled as far as possible to avoid any additional water usage.	-	Throughout the plant operational phase
			Reduce change in traffic patterns through controlling management measures. • Where feasible heavy vehicles should not operate on public roads during peak hours; and • Heavy vehicles should adhere to the speed limit of the road.	Legal speed limits South African Road Signs Manual	Throughout the plant operational phase
			Prevent accidents through controlling management measures. • Drivers will be enforced to keep to set speed limits. • Trucks will be in a road-worthy condition. • Roads and intersections will be signposted clearly. Only main roads should be used; • Where feasible vehicles should not operate on public roads during peak hours; • Heavy vehicles should always travel with their head lights switched on; • Heavy vehicles should not stop on the road to pick up hitchhikers – No stopping on the road approaching the mine will be allowed; • Single directional traffic shall be controlled through a stop-go system or any other appropriate traffic control method;	Legal speed limits South African Road Signs Manual	Throughout the plant operational phase

ACTIVITIES	PHASE	SIZE AND SCALE of disturbance	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			• Samancor shall be responsible for ensuring that suitable access is maintained for public traffic to all relevant businesses and properties; and • All traffic accommodation measures are to conform to the latest edition of the South African Road Signs Manual.		
			Prevent fire through controlling management measures. • All workers will be sensitised to the risk of fire; • Smoking is only allowed in designated smoking areas and dispose of cigarette butts safely in sand buckets; • The Applicant shall ensure that the basic fire-fighting equipment is available on the site; • Extinguishers should be located outside hazardous materials and chemicals storage containers; Fire response and evacuation • An Emergency Plan (including Fire Protection, Response and Evacuation Plan) is to be prepared by the Applicant and conveyed to all staff on the site; • Identify major risks to minimise the environmental impacts e.g., air pollution and contaminated effluent runoff.	Mine Health and Safety Act (Act 29 of 1996) An Emergency Plan (including Fire Protection, Response and Evacuation Plan) Veld and Forest Fire Act, 1998 (Act No. 101 of 1998) [as amended] • Section 12 (1) Duty of the landowner to prevent fire from spreading to neighbouring properties.	Throughout the plant operational phase
			Prevent health and safety incidents through controlling management measures. • A health and safety plan in terms of the Mine Health and Safety Act (Act 29 of 1996) should be compiled and implemented to ensure worker safety; • A health and safety control officer should monitor the implementation of the health and safety plan for the operational phase; • Regular health and safety audits should be conducted and documented; and a record of health and safety incidents should be kept on site and made available for inspection;	Health and safety plan in terms of the Mine Health and Safety Act (Act 29 of 1996	Throughout the plant operational phase

ACTIVITIES	PHASE	SIZE AND SCALE of disturbance	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			• Any health and safety incidents should be reported to the Site Manager (SM) immediately; • First aid facilities should be available on site at all times; • Workers have the right to refuse work in unsafe conditions; and • Material stockpiles or stacks should be stable and well secured to avoid collapse and possible injury to site workers.		
Maintenance of the crusher, screen, conveyors, cleaning magnet, and transfer chute	Operational	Extent of new infrastructure on total area allocated of 24 841 m^2	**Reduce and remedy siltation through controlling management measures.** • The Site Manager (SM) should ensure that excessive quantities of sand, silt and silt-laden water do not enter the stormwater system; • Appropriate measures, e.g. construction of silt traps, or drainage retention areas to prevent silt and sand entering drainage should be taken; • No wastewater may run freely into any of the surrounding naturally vegetated areas; • The loss of topsoil must be minimised; • Erosion and subsequent siltation must be limited; • Any drainage channels shall be suitably designed to ensure that erosion does not occur; • All areas susceptible to erosion shall be protected and stabilisation measures implemented; • Packing of sandbags, gabions, straw bales or brush to reduce the speed of water flow where water is scouring the topsoil and results in the formation of erosion gullies; • Any surface runoff generated which has a high suspended solid content shall be collected at the point source in an appropriate containment facility, then be allowed to settle before discharge into the environment; and • A stormwater management plan must be compiled; and should be approved by DWS and implemented.	Rehabilitation objectives and standards Approved IWWMP Approved Storm Water Management Plan GN704 Regulations in terms of the National Water Act, 1998 (Act No 36 of 1998)	Throughout the plant operational phase

ACTIVITIES	PHASE	SIZE AND SCALE of disturbance	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
Loading, hauling and transport of materials	Operational	Extent of new infrastructure on total area allocated of 24 841 m^2	**Prevent through controlling management measures.** In accordance with Government Notice 704 (GN 704), the onsite management should: • Keep clean and dirty water separated; • Contain any dirty water within a system; and • Prevent the contamination of clean water. In order to achieve these objectives, the following stormwater management measures must be implemented on the site to ensure that that potential stormwater impacts are kept to a minimum: • Clean and dirty stormwater needs to be separated. Dirty stormwater may not be released into the environment and should be contained and treated on site; • The operation and maintenance of the stormwater and waste water containment facilities shall be done in accordance with the requirements of the Integrated Water Use License and Integrated Water and Waste Management Plan (IWWMP); • All temporary storm water infrastructure (if any) on-site shall be maintained and kept clean throughout the construction period; • Immediate reporting of any polluting or potentially polluting incidents so that appropriate measures can be implemented; • Fuel and oil spills shall be treated immediately by appropriate mop-up products. Several hydrocarbon absorption/remediation products (i.e. Spill kits) must be placed throughout the site; • Use of bunds or traps to ensure full containment of hydrocarbon and other hazardous materials are mandatory; • Any contaminated material is disposed of in an appropriate manner and the potential risks associated with such spills are limited; • Stormwater leaving the site must in no way be contaminated by any substance, whether such substance is a solid, liquid, vapour	Rehabilitation objectives and standards Approved IWWMP Approved Storm Water Management Plan GN704 Regulations in terms of the National Water Act, 1998 (Act No 36 of 1998)	Throughout the plant operational phase

ACTIVITIES	PHASE	SIZE AND SCALE of disturbance	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			or gas or a combination thereof which is produced, used, stored, dumped or spilled on the premises; • All hazardous substances should be stored on impervious surfaces that allow for the containment of spills and leakages (e.g. bunded areas). Should spills occur, these should be reported to the Site Manager. • Liquid hazardous waste shall be contained and stored according to the prescribed measures; • Increased runoff should be managed using berms and other suitable structures as required to ensure flow velocities are reduced; and • Removal of spills, rainwater and waste produced during clean-up of the bunds – shall be done in accordance to relevant specifications; and		
Dust Suppression	Operational	Extent of new infrastructure on total area allocated of 24 841 m^2	**Prevent loss of natural resources (groundwater) for dust suppression.** Water should be recycled as far as possible to avoid any groundwater abstraction.	-	Throughout the plant operational phase
Storage of raw material and product stockpiles	Operational	Extent of new infrastructure on total area allocated of 24 841 m^2	**Reduce and control groundwater pollution through management measures.** • Mine management will draw up all rehabilitation plans. After the plans are approved by the competent authority, they will be implemented. Monitoring and modelling of the groundwater will continue until a closure certificate is issued; • The closure strategy will be re-assessed to determine containment, treatment and/or re-use options through the monitoring and calibration of the groundwater model during the operational phase; and • Should monitoring results indicate potential decant or confirm the formation and movement of a pollution plume in the shallow aquifer, management, containment or treatment measures will	Rehabilitation Objectives and standards Groundwater monitoring plan Department of Water and Sanitation Water Quality limits SANS 241: 2011 Standard for Drinking Water	Throughout the plant operational phase

ACTIVITIES	PHASE	SIZE AND SCALE of disturbance	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			be implemented to prevent impact on the receiving surface water and groundwater environment.		
Closure and Post-Closure Phases	All of the impacts described above will be applicable to the closure phase.	Refer to the above mitigation measures for impacts during the operational phase.	Please refer to the above standards	Please refer to the above standards	Closure and Post-Closure Phases

e) Impact Management Outcomes

(A description of impact management outcomes, identifying the standard of impact management required for the aspects contemplated in paragraph ( )

Table 23: Impact Management Outcomes

ACTIVITY whether listed or not listed.	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	STANDARD TO BE ACHIEVED
Construction of crusher, screen, conveyors, cleaning magnet, and transfer chute	Soil Contamination	Soil	Construction	• Control through maintenance programmes and measures for vehicles and plant; • Control through Spill Procedure implementation; • Control and remedy through hazardous material handling procedures.	Loss of soil Meet rehabilitation objectives and standards.
	Soil Compaction	Soil	Construction	• Control through management of access; • Control and remedy through rehabilitation measures.	Loss of soil Meet rehabilitation objectives and standards.
	Erosion and siltation	Hydrology Groundwater	Construction	• Control through implementing stormwater management plan;	Clean and functioning stormwater management system.

ACTIVITY whether listed or not listed.	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	STANDARD TO BE ACHIEVED
		Surface water		• Control through management and monitoring.	No dirty water leaving the site. Meet rehabilitation objectives and standards.
	Spills and leaks of chemicals and cement	Hydrology Groundwater Surface water Stormwater	Construction	• Control through implementing stormwater management plan; • Control through management and monitoring. • Control through Spill Procedure implementation; • Control and remedy through hazardous material handling procedures.	Clean and functioning stormwater management system. No evidence of spills on site. Meet rehabilitation objectives and standards.
	Altered drainage patterns and stormwater runoff flows	Hydrology Groundwater Surface water	Construction	• Control through implementing stormwater management plan; • Control through management and monitoring. • Control through implementing specialist groundwater study recommendations.	Clean and functioning stormwater management system. Meet rehabilitation objectives and standards.
	Decrease in significant biodiversity	Biodiversity	Construction	• Control through layout planning and implementing no-go areas. • Control through implementing Ecological Scan recommendations.	Meet rehabilitation objectives and standards. No impact on significant biodiversity.
	Spreading of Alien Invasive Species and bush encroachment of indigenous species	Biodiversity	Construction	• Control through implementation of alien management plan.	Meet rehabilitation objectives and standards. Proof of alien vegetation control and no listed species visible on site.
	Impact on migratory routes and faunal dispersal patterns	Biodiversity	Construction	• Control through implementation of no-go areas.	Meet rehabilitation objectives and standards. Migratory routes, if any, maintained.

ACTIVITY whether listed or not listed.	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	STANDARD TO BE ACHIEVED
	Disturbance and loss of fauna through noise, light and dust pollution and hunting, trapping and killing of fauna.	Biodiversity	Construction	• Control through environmental awareness training.	Proof of records of environmental awareness training. Meet air emission standards. Meet rehabilitation objectives and standards.
	Loss of land use for other purposes.	Land use	Construction	• None.	-
	Loss of archaeological resources	Heritage	Construction	• Control through implementing Phase 1 Archaeological Impact Assessment recommendations, should artefacts be uncovered.	Prevention of loss of archaeological resources. Meet the requirements of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) and associated regulations.
	Visual scarring	Aesthetic	Construction	• Control through monitoring housekeeping. • Control through inspection of lighting infrastructure. • Control through implementation of Visual Impact Assessment specialist recommendations.	Meet rehabilitation objectives and standards. No complaints related to visual impacts of construction.
	Increase of ambient noise levels	Nuisance and health risks	Construction	• Control through monitoring of records. • Control through implementation of Noise Baseline Assessment specialist recommendations.	Meet rehabilitation objectives and standards. No complaints related to noiseimpacts of construction. Meet SANS 10103:2008 Compliant with MHSA (29 of 1996)

ACTIVITY whether listed or not listed.	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	STANDARD TO BE ACHIEVED
					Records of service of all operational vehicles and silencers installed.
	Dust pollution	Air quality	Construction	• Control through implementing Air Quality Baseline Report specialist recommendations. • Control through implementing dust suppression.	No complaints related to dust impacts of construction. South Africa National Standard 1929:2005: Ambient Air Quality: Limits for common pollution Meet the requirements of the National Dust Control regulations, 2013, as published in the Government Gazette (No. 36974) of 1 November 2013 (GNR 827 of 1 November 2013), in terms of the National Environmental Management: Air Quality Act 39 of 2004 Dust fall monitoring programme should be implemented. Dust fallout and Particulate Matter (PM) levels may not exceed the limits as set out in the Dust Control Regulations above.
	Waste generation	Waste	Construction	• Control through implementing waste procedure. • Prevent through providing awareness training. • Control through the regular removal of wastes by registered waste services provider.	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

ACTIVITY whether listed or not listed.	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	STANDARD TO BE ACHIEVED
					Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) [as amended] and: Regulations regarding the planning and management of residue stockpiles and residue deposits from a prospecting, mining, exploration or production operation (GN R. 632 of 2015) SANS 10234: 2008: Globally Harmonized System of classification and labelling of chemicals (GHS) Above standards achieved.
	Need for water, electricity and sewerage systems	Services	Construction	• Control through awareness training. • Remedy through recycling practices.	Minimum resource requirements on site.
	Change in traffic patterns	Traffic	Construction	• Control through implementing traffic management plan.	No incidents or complaints received.
	Nuisance, health and safety risks caused by increased traffic	Traffic	Construction	• Control through implementing traffic management plan.	No incidents or complaints received.
	Veld fires	Health and safety	Construction	• Control through providing awareness training. • Control through providing minimum requirement of fire fighting equipment and regularly service equipment. • Prevent through risk assessments. • Control through fire drills and implementing emergency management plan.	No incidents or complaints received.

ACTIVITY whether listed or not listed.	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	STANDARD TO BE ACHIEVED
	Health risks due to construction activities (excavation, material storage, etc)	Health and safety	Construction	• Prevent through barricading, safety signs, PPE. • Control through implementation of health and safety management plan. • Control through monitoring by health and safety control officer.	No health and safety incidents.
Stockpiling of raw material **Operation** of crusher, screen, conveyors, cleaning magnet, and transfer chute Stockpiling of product (Ready-mix concrete, Pre-bagged products, Stope support systems for the mining industry, Precast walling, Kerbs and edging)	Soil Contamination	Soil	Operation	• Control through maintenance programmes and measures for vehicles and plant; • Control through Spill Procedure implementation; • Control and remedy through hazardous material handling procedures.	Loss of soil Meet rehabilitation objectives and standards.
	Soil Compaction	Soil	Operation	• Control through management of access; • Control and remedy through rehabilitation measures.	Loss of soil Meet rehabilitation objectives and standards.
	Erosion and siltation	Hydrology Groundwater Surface water	Operation	• Control through implementing stormwater management plan; • Control through management and monitoring.	Clean and functioning stormwater management system. No dirty water leaving the site. Meet rehabilitation objectives and standards.
	Spills and leaks of chemicals and cement	Hydrology Groundwater Surface water Stormwater	Operation	• Control through implementing stormwater management plan; • Control through management and monitoring. • Control through Spill Procedure implementation; • Control and remedy through hazardous material handling procedures.	Clean and functioning stormwater management system. No evidence of spills on site. Meet rehabilitation objectives and standards.

ACTIVITY whether listed or not listed.	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	STANDARD TO BE ACHIEVED
	Altered drainage patterns and stormwater runoff flows	Hydrology Groundwater Surface water	Operation	• Control through implementing stormwater management plan; • Control through management and monitoring. • Control through implementing specialist groundwater study recommendations.	Clean and functioning stormwater management system. Meet rehabilitation objectives and standards.
	Decrease in significant biodiversity	Biodiversity	Operation	• Control through layout planning and implementing no-go areas. • Control through implementing Ecological Scan recommendations.	Meet rehabilitation objectives and standards. No impact on significant biodiversity.
	Spreading of Alien Invasive Species and bush encroachment of indigenous species	Biodiversity	Operation	• Control through implementation of alien management plan.	Meet rehabilitation objectives and standards. Proof of alien vegetation control and no listed species visible on site.
	Impact on migratory routes and faunal dispersal patterns	Biodiversity	Operation	• Control through implementation of no-go areas.	Meet rehabilitation objectives and standards. Migratory routes, if any, maintained.
	Disturbance and loss of fauna through noise, light and dust pollution and hunting, trapping and killing of fauna.	Biodiversity	Operation	• Control through environmental awareness training.	Proof of records of environmental awareness training. Meet air emission standards. Meet rehabilitation objectives and standards.
	Loss of land use for other purposes.	Land use	Operation	• None.	-
	Visual scarring	Aesthetic	Operation	• Control through monitoring housekeeping. • Control through inspection of lighting infrastructure.	Meet rehabilitation objectives and standards. No complaints related to visual impacts of construction.

ACTIVITY whether listed or not listed.	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	STANDARD TO BE ACHIEVED
				• Control through implementation of Visual Impact Assessment specialist recommendations.	
	Increase of ambient noise levels	Nuisance and health risks	Operation	• Control through monitoring of records. • Control through implementation of Noise Baseline Assessment specialist recommendations.	Meet rehabilitation objectives and standards. No complaints related to noiseimpacts of construction. Meet SANS 10103:2008 Compliant with MHSA (29 of 1996) Records of service of all operational vehicles and silencers installed.
	Dust pollution	Air quality	Operation	• Control through implementing Air Quality Baseline Report specialist recommendations. • Control through implementing dust suppression.	No complaints related to dust impacts of construction. South Africa National Standard 1929:2005: Ambient Air Quality: Limits for common pollution Meet the requirements of the National Dust Control regulations, 2013, as published in the Government Gazette (No. 36974) of 1 November 2013 (GNR 827 of 1 November 2013), in terms of the National Environmental Management: Air Quality Act 39 of 2004

ACTIVITY whether listed or not listed.	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	STANDARD TO BE ACHIEVED
					Dust fall monitoring programme should be implemented. Dust fallout and Particulate Matter (PM) levels may not exceed the limits as set out in the Dust Control Regulations above.
	Waste generation	Waste	Operation	• Control through implementing waste procedure. • Prevent through providing awareness training. • Control through the regular removal of wastes by registered waste services provider.	Waste Classification and Management Regulations and Norms and Standards for the assessment of for landfill disposal and for disposal of waste to landfill, 2013 (Government Notice 634 – 635 of 2013) promulgated in terms of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) [as amended] and: Regulations regarding the planning and management of residue stockpiles and residue deposits from a prospecting, mining, exploration or production operation (GN R. 632 of 2015) SANS 10234: 2008: Globally Harmonized System of classification and labelling of chemicals (GHS) Above standards achieved.
	Need for water, electricity and sewerage systems	Services	Operation	• Control through awareness training. • Remedy through recycling practices.	Minimum resource requirements on site.

ACTIVITY whether listed or not listed.	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	STANDARD TO BE ACHIEVED
	Change in traffic patterns	Traffic	Operation	• Control through implementing traffic management plan.	No incidents or complaints received.
	Nuisance, health and safety risks caused by increased traffic	Traffic	Operation	• Control through implementing traffic management plan.	No incidents or complaints received.
	Veld fires	Health and safety	Operation	• Control through providing awareness training. • Control through providing minimum requirement of fire fighting equipment and regularly service equipment. • Prevent through risk assessments. • Control through fire drills and implementing emergency management plan.	No incidents or complaints received.
	Health risks due to construction activities (excavation, material storage, etc)	Health and safety	Operation	• Prevent through barricading, safety signs, PPE. • Control through implementation of health and safety management plan. • Control through monitoring by health and safety control officer.	No health and safety incidents.
Maintenance of the crusher, screen, conveyors, cleaning magnet, and transfer chute	Spillage	Surface water Groundwater Soil	Operation	• Control through implementation of approved IWWMP. • Control through implementation of approved stormwater management plan. • Control through monitoring compliance with GN 704 Regulations.	Meet rehabilitation objectives and standards. No major environmental incidents as a result of maintenance.
Loading, hauling and transport	Spillage	Surface water Groundwater Soil	Operation	• Control through implementation of approved IWWMP. • Control through implementation of approved stormwater management plan. • Control through monitoring compliance with GN 704 Regulations.	Meet rehabilitation objectives and standards. No major environmental incidents as a result of maintenance.

ACTIVITY whether listed or not listed.	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	STANDARD TO BE ACHIEVED
Dust Suppression	Water use	Resource	Operational	• Control through recycling.	No additional water required for dust suppression.
Storage of raw material and product stockpiles	Seepage	Surface water Groundwater Soil	Operation	• Control through implementation of rehabilitation plans and groundwater monitoring programme.	No impact on groundwater quality.
Closure and post closure phases	All of the impacts described above will be applicable to the closure phase.				

Impact Management Actions

(A description of impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraphs (c) and (d) will be achieved).

Table 24: Impact Management Actions

ACTIVITY whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
Construction of crusher, screen, conveyors, cleaning magnet, and transfer chute	Soil	**Prevent and reduce and remedy the contamination of soil and water as well as ensure the safety of people through management measures.** • All vehicles and machinery will be regularly serviced to ensure they are in proper working condition and to reduce risk of leaks;	During site establishment, site clearance, construction.	Rehabilitation objectivesnand standards Spill procedure Approved IWWMP Hazardous Substances Act, 1973 (Act 15 of 1973) [as amended] • Section 2

ACTIVITY whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		• All leaks will be cleaned up immediately using an absorbent material and spill kits, in the prescribed manner; and • The approved Integrated Water and Waste Management Plan to be implemented. ***Hydrocarbons and hazardous waste*** • All hazardous waste generated shall be kept separate and shall not be mixed with general waste; and • All hazardous waste shall be stored within a sealed drum on an impermeable surfaced area within the central waste storage and transition area. **Protect heritage resources:** • Should culturally significant material or skeletal remains be exposed during development and construction phases, all activities must be suspended pending further investigation by a qualified archaeologist (Refer to the National Heritage and Resources Act, 25 of 1999 section 36 (6)); • Should any objects of archaeological or palaeontological remains be found during construction activities, work must immediately stop in that area and		Declaration of grouped hazardous substances; • Section 9 (1) Storage and handling of hazardous chemical substances • Section 18 Offences Hazardous Chemical Substances Regulations, 1995 (Government Notice 1179 of 1995) • Section 4 Duties of persons who may be exposed to hazardous chemical substances SANS 10234: 2008: Globally Harmonized System of classification and labelling of chemicals (GHS)

ACTIVITY whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		the Environmental Control Officer (ECO) must be informed; • The ECO must inform SAHRA and contact an archaeologist and / or palaeontologist, depending on the nature of the find, to assess the importance and rescue them if necessary (with the relevant SAHRA permit). No work may be resumed in this area without the permission of the ECO and SAHRA; and If the newly discovered heritage resource is considered significant, a Phase 2 assessment may be required. A permit from the responsible authority will be required.		
	Soil	**Prevent and reduce and remedy soil compaction through management measures.** • Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants; and • Soils compacted, should be deeply ripped at least to a depth of 300mm to loosen compacted layers and re-graded to even running levels.	During site establishment, site clearance, construction.	Rehabilitation objectives and standards
	Hydrology Groundwater Surface water	**Prevent and reduce and remedy siltation through management measures.**	During site establishment, site clearance, construction.	Rehabilitation objectives and standard Approved IWWMP

ACTIVITY whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		• The Site Manager (SM) should ensure that excessive quantities of sand, silt and silt-laden water do not enter the stormwater system; • Appropriate measures, e.g. construction of silt traps, or drainage retention areas to prevent silt and sand entering drainage or should be taken; • No wastewater may run freely into any of the surrounding naturally vegetated areas; • The loss of topsoil must be minimised; • Erosion and subsequent siltation must be limited; • Any drainage channels shall be suitably designed to ensure that erosion does not occur; • All areas susceptible to erosion shall be protected and stabilisation measures implemented: • Packing of sandbags, gabions, straw bales or brush to reduce the speed of water flow where water is scouring the topsoil and results in the formation of erosion gullies; • Any surface runoff generated which has a high suspended solid content shall be collected at the point source in an appropriate containment facility, then be allowed to settle before being		Approved Stormwater Management Plan GN704 Regulations in terms of the National Water Act, 1998 (Act No 36 of 1998)

ACTIVITY whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		discharged into the environment; and • A stormwater management plan must be compiled, and should be approved by DWS and implemented.		
	Hydrology Groundwater Surface water Soil	**Prevent and reduce water and soil pollution through management measures.** In accordance with Government Notice 704 (GN 704), the onsite management should: • Keep clean and dirty water separated; • Contain any dirty water within a system; and • Prevent the contamination of clean water. In order to achieve these objectives, the following stormwater management measures must be implemented on the site to ensure that that potential stormwater impacts are kept to a minimum: • Clean and dirty stormwater needs to be separated. Dirty stormwater may not be released into the environment and should be contained and treated on site; • All temporary storm water infrastructure (if any) on-site shall	During site establishment, site clearance, construction.	Rehabilitation objectives and standard Spill Procedure Approved IWWMP Approved Stormwater Management Plan GN704 Regulations in terms of the National Water Act, 1998 (Act No 36 of 1998)

ACTIVITY whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		be maintained and kept clean throughout the construction period; • Immediate reporting of any polluting or potentially polluting incidents so that appropriate measures can be implemented; • Fuel and oil spills shall be treated immediately by appropriate mop-up products. Several hydrocarbon absorption/remediation products (i.e. Spill kits) must be placed throughout the site. The approved spill procedure to be implemented; • Use of bunds or traps to ensure full containment of hydrocarbon and other hazardous materials are mandatory; • Any contaminated material is disposed of in an appropriate manner and the potential risks associated with such spills are limited; • Stormwater leaving the site must in no way be contaminated; • Increased runoff should be managed using berms and other suitable structures as required to ensure flow velocities are reduced; • Removal of spills, rainwater and waste produced during clean-up of the bunds – shall be done in accordance to relevant specifications;		

ACTIVITY whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		• Ensure good housekeeping practices.		
	Biodiversity	**Reduce loss of vegetation and fauna through management measures.** • Any sensitive herpetofauna inadvertently killed during earth moving activities, should be preserved as museum voucher specimens; • Any stormwater cut-off channels should be kept as natural as possible with gentle slopes (45° angle or less) on the side away from mining activities. Channels should also have rough surfaces and rocks, less "curvature" on the walls to enable smaller animals to escape. A "step" in the slope of the walls and a "lip" on the edge of the channel will deter animals from entering the channels; • Only vegetation falling directly in demarcated access routes or project sites should be removed where necessary; • No further vegetation clearance except for the removal of alien invasive species will be allowed; and • All remaining indigenous vegetation should be conserved wherever possible.	During site establishment, site clearance, construction.	Alien and Invasive Species Management Plan Rehabilitation Objectives and Standards 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 2014)

ACTIVITY whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
	Biodiversity	**Prevent and control alien vegetation from spreading through management measures.** • An alien vegetation management plan should be compiled and implemented; • Regular removal of invasive alien species should be undertaken. This should extend right through to the closure phase of the project; and • No spread of alien vegetation onto adjacent properties should be allowed.	During site establishment, site clearance, construction.	Alien and Invasive Species Management Plan Rehabilitation Objectives and Standards 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 2014)
	Biodiversity	**Conserve and / or restore migratory routes of fauna through management measures.** Reduce the levels of disturbance on areas indicated by the Environmental Control Officer (ECO) as migratory routes, if any.	During site establishment, site clearance, construction.	Rehabilitation objectives and standards
	Biodiversity	**Reduce disturbance and loss of fauna through controlling measures.** • Environmental awareness training should include that no hunting, trapping or killing of fauna are allowed; • Any animals rescued or recovered will be relocated in suitable habitat away from the mining operations and associated infrastructure; • Any lizards, snakes or monitors encountered should be allowed to	During site establishment, site clearance, construction.	Rehabilitation objectives and standards

ACTIVITY whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		escape to suitable habitat away from disturbance. • No reptile should be intentionally killed, caught or collected during any phase of the project; and • General avoidance of snakes is the best policy if encountered. Snakes should not be intentionally harmed or killed and allowed free movement away from the area.		
	Aethetic (visual)	**Reduce visual impact through controlling management measures.** • Housekeeping on site should be enforced; • Rehabilitation measures such as re-vegetation and plan to be implemented; • Install lights that will not create a night sky glow; • Reduce the construction period through careful planning and productive implementation of resources; • Plan the placement of lay-down areas and any potential temporary construction camps in order to minimise vegetation clearing; • Restrict the activities and movement of construction workers and vehicles to the immediate construction site and existing access roads;	During site establishment, site clearance, construction.	-

ACTIVITY whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		• Ensure that rubble, litter and issued construction materials are managed and removed regularly; • Ensure that all infrastructure and the site and general surrounds are maintained in a neat and appealing way; and • Reduce and control construction dust through the use of approved dust suppression techniques.		
	Noise and lighting	**Reduce noise disturbance/ increased level of noise through controlling measures.** • Vehicles will be regularly serviced to ensure acceptable noise levels are not exceeded. Silencers will be utilised where possible; • Heavy vehicle traffic should be routed away from noise sensitive areas where possible; • Noise levels should be kept within acceptable limits. All noise and sounds generated should adhere to South African Bureau of Standards (SABS) specifications for maximum allowable noise levels for construction sites. No pure tone sirens or hooters may be utilised except where required in terms of SABS standards or in emergencies; • With regard to unavoidable very noisy construction activities in the vicinity of noise sensitive areas, the	During site establishment, site clearance, construction.	The South African National Standard SANS 10103:2008

ACTIVITY whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		Site Manager (SM) should liaise with local residents and how best to minimise impacts, and the local population should be kept informed of the nature and duration of intended activities; • The SM should take measures to discourage labourers from loitering in the area, causing noise disturbance; • Noise impacts should be minimised by restricting the hours (between 06h00 and 18h00 on Monday to Friday, and 06h00 and 13h00 on Saturdays), during which the offending activities are carried out and, where possible, by insulating machinery and/or enclosing areas of activity; • Should any complaints be received, noise monitoring should be conducted and specialist recommendations implemented where possible; • Personal Protective Equipment to all persons working in areas where high levels of noise can be expected; Signs where it is compulsory; • Proper design of the plant areas and machinery where measures are taken to prevent noise generation such as silencers,		

ACTIVITY whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		mufflers and sound suppressing enclosures for parts/processes which can generate noise; • Regular inspections and maintenance of equipment, vehicles and machinery to prevent unnecessary noise; • Noise breaking barriers can be erected such as netting, walls or high growing trees; and • Placement of noise generating activities can be planned as far away as possible from affected areas or persons.		
	Aesthetic	**Reduce light pollution through controlling measures.** • Unnecessary lights should be switched off during the day and / or night to avoid light pollution; • Install lights that will not create a night sky glow; • If lighting is required, the lighting will be located in such a place and such a manner so as to minimise any impact on the surrounding community; and • Security lighting should be designed in such a way as to minimise emissions onto undisturbed areas on site and neighbouring properties. Light fittings should face downwards.	During site establishment, site clearance, construction.	-

ACTIVITY whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
	Air quality	**Reduce air and dust pollution through controlling measures.** • Dust suppression shall be implemented during dry periods and windy conditions; • All exposed surfaces should be minimised in terms of duration of exposure to wind and stormwater; • Excavation, handling and transportation of erodible materials shall be avoided under high wind conditions (excess of 35km/hr) / when visible dust plume is present; • Ensure that shortest routes are used for material transport; • Ensure that stockpile height is kept to a minimum and that any stockpiling occurs downwind of the stockpiles; • Minimise travel speed on paved roads (30 km/h); • Should any complaints be received, additional dust monitoring should be implemented for the waste rock beneficiation facility; • Implement monthly site inspection to check for possible areas of dust generation not addressed or not effectively managed; • Spray areas to be cleared with water.	During site establishment, site clearance, construction.	South Africa National Standard 1929:2005: Ambient Air Quality: Limits for common pollution National Dust Control regulations, 2013, as published in the Government Gazette (No. 36974) of 1 November 2013 (GNR 827 of 1 November 2013), in terms of the National Environmental Management: Air Quality Act 39 of 2004 Approved dust fall monitoring programme

ACTIVITY whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		• Ensure minimum travel distance between working areas and stockpiles. • Ensure that topsoil for stockpiles is sprayed with water before tipping to prevent dust generation. • Ensure graded areas are sprayed with water. • Minimise the amount of graded areas. • Load and offload material, as far as possible, downwind of stockpiles.		
	Waste	**Control waste through management measures.** • The conditions of the Integrated Water Use License (IWUL) and the IWWMP must be implemented. • A central waste storage and transition area shall be established within the site camp; • The central waste storage and transition area shall be surfaced and demarcated appropriately; • Portable wheelie bins shall be placed throughout the site camp as well as at the remainder of the site and at all working areas in the field; • Wheelie bins shall be colour coded and labelled to identify the waste stream for which it is intended; • All portable wheelie bins and other containers shall be emptied at the central waste storage and transition	During site establishment, site clearance, construction.	Approved IWWMP Waste Classification and Management Regulations and Norms and Standards for the assessment of for landfill disposal and for disposal of waste to landfill, 2013 (Government Notice 634 – 635 of 2013) promulgated in terms of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) [as amended] and: SANS 10234: 2008: Globally Harmonized System of classification and labelling of chemicals (GHS)

ACTIVITY whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		area a minimum of once a week as to avoid waste build up; • The waste shall be removed (within 30 days) by a licensed waste service provider as shall be disposed of at a licensed waste landfill site and records of safe disposal (as required for hazardous wastes) shall be supplied to the Millsell operations. These records shall be kept on site by the ESM. • Wherever possible and practical, waste materials generated on site must be recycled.		
	Services	**Reduce use of natural resources through controlling management measures.** • Energy savings measures to be implemented at the mine, e.g.: ➢ No lights to be switched on unnecessarily. Only security lights to be switched on at night; • Energy saving bulbs to be installed; and • Water should be recycled as far as possible to avoid any additional water usage.	During site establishment, site clearance, construction.	-
	Traffic	**Reduce change in traffic patterns through controlling management measures.**		Legal speed limits South African Road Signs Manual

ACTIVITY whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		• Where feasible heavy vehicles should not operate on public roads during peak hours; and • Heavy vehicles should adhere to the speed limit of the road.		
	Health and safety	**Prevent accidents through controlling management measures.** • Drivers will be enforced to keep to set speed limits. • Trucks will be in a road-worthy condition. • Roads and intersections will be signposted clearly. Only main roads should be used; • Where feasible vehicles should not operate on public roads during peak hours; • Heavy vehicles should always travel with their head lights switched on; • Heavy vehicles should not stop on the road to pick up hitchhikers – No stopping on the road approaching the mine will be allowed; • Single directional traffic shall be controlled through a stop-go system or any other appropriate traffic control method; • Samancor shall be responsible for ensuring that suitable access is maintained for public traffic to all relevant businesses and properties; and	During site establishment, site clearance, construction.	Legal speed limits South African Road Signs Manual

ACTIVITY whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		• All traffic accommodation measures are to conform to the latest edition of the South African Road Signs Manual.		
	Health and safety	**Prevent fire through controlling management measures.** • All workers will be sensitised to the risk of fire; • Smoking is only allowed in designated smoking areas and dispose of cigarette butts safely in sand buckets; • The Applicant shall ensure that the basic fire-fighting equipment is available on the site; • Extinguishers should be located outside hazardous materials and chemicals storage containers; Fire response and evacuation • An Emergency Plan (including Fire Protection, Response and Evacuation Plan) is to be prepared by the Applicant and conveyed to all staff on the site; • Identify major risks to minimise the environmental impacts e.g., air pollution and contaminated effluent runoff.	During site establishment, site clearance, construction.	An Emergency Plan (including Fire Protection, Response and Evacuation Plan) Veld and Forest Fire Act, 1998 (Act No. 101 of 1998) [as amended] • Section 12 (1) Duty of the landowner to prevent fire from spreading to neighbouring properties.
	Health and safety	**Prevent health and safety incidents through controlling management measures.**	During site establishment, site clearance, construction.	Health and safety plan in terms of the Mine Health and Safety Act (Act 29 of 1996

ACTIVITY whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		• A health and safety plan in terms of the Mine Health and Safety Act (Act 29 of 1996) should be compiled and implemented to ensure worker safety; • A health and safety control officer should monitor the implementation of the health and safety plan for the operational phase; • Regular health and safety audits should be conducted and documented; and a record of health and safety incidents should be kept on site and made available for inspection; • Any health and safety incidents should be reported to the Site Manager (SM) immediately; • First aid facilities should be available on site at all times; • Workers have the right to refuse work in unsafe conditions; • Material stockpiles or stacks should be stable and well secured to avoid collapse and possible injury to site workers. • Access to excavation must be controlled; • Excavated areas should be temporarily fenced-off; and • Excavations, such as pipeline excavations, will be backfilled and landscaped as soon as possible.		

ACTIVITY whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
Stockpiling of raw material **Operation** of crusher, screen, conveyors, cleaning magnet, and transfer chute Stockpiling of product (Ready-mix concrete, Pre-bagged products, Stope support systems for the mining industry, Precast walling, Kerbs and edging)	Soil	**Reduce and remedy soil compaction and degradation through controlling management measures.** • The approved stormwater management plan must be implemented; • Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants; and • Soils compacted, should be deeply ripped at least to a depth of 300mm to loosen compacted layers and re-graded to even running levels.	Throughout the plant operational phase	Rehabilitation Objectives and Standards
	Hydrology Groundwater Surface water	**Prevent soil and water pollution through controlling management measures.** • Groundwater monitoring quarterly and surface water monitoring monthly as is currently practiced by Millsell; • Develop a groundwater flow model for the site to simulate groundwater flow and predict contaminant migration; • All vehicles and machinery will be regularly serviced to ensure they are in proper working condition and to reduce risk of leaks; • All leaks will be cleaned up immediately using an absorbent material and spill kits, in the prescribed manner; and	Throughout the plant operational phase	Rehabilitation objectives and standards Spill procedure Approved IWWMP Hazardous Substances Act, 1973 (Act 15 of 1973) [as amended] Section 2 Declaration of grouped hazardous substances; • Section 9 (1) Storage and handling of hazardous chemical substances • Section 18 Offences Hazardous Chemical Substances Regulations, 1995 (Government Notice 1179 of 1995).

ACTIVITY whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		• The approved Integrated Water and Waste Management Plan to be implemented. ***<u>Hydrocarbons and hazardous waste</u>*** • All hazardous waste generated shall be kept separate and shall not be mixed with general waste; and • All hazardous waste shall be stored within a sealed drum on an impermeable surfaced area within the central waste storage and transition area.		• Section 4 Duties of persons who may be exposed to hazardous chemical substances. SANS 10234: 2008: Globally Harmonized System of classification and labelling of chemicals (GHS)
	Hydrology Groundwater Surface water	**Prevent and reduce and remedy siltation through management measures.** • The Site Manager (SM) should ensure that excessive quantities of sand, silt and silt-laden water do not enter the stormwater system; • Appropriate measures, e.g. construction of silt traps, or drainage retention areas to prevent silt and sand entering drainage or should be taken; • No wastewater may run freely into any of the surrounding naturally vegetated areas; • Erosion and subsequent siltation must be limited; • Any drainage channels shall be suitably designed to ensure that erosion does not occur;	Throughout the plant operational phase	Rehabilitation objectives and standard Approved IWWMP Approved Stormwater Management Plan GN704 Regulations in terms of the National Water Act, 1998 (Act No 36 of 1998)

ACTIVITY whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		• All areas susceptible to erosion shall be protected and stabilisation measures implemented: • Packing of sandbags, gabions, straw bales or brush to reduce the speed of water flow where water is scouring the topsoil and results in the formation of erosion gullies; • Any surface runoff generated which has a high suspended solid content shall be collected at the point source in an appropriate containment facility, then be allowed to settle before being discharged into the environment; and • A stormwater management plan must be compiled, and should be approved by DWS and implemented.		
	Surface water Groundwater Soil	**Prevent and reduce water and soil pollution through management measures.** In accordance with Government Notice 704 (GN 704), the onsite management should: • Keep clean and dirty water separated; • Contain any dirty water within a system; and • Prevent the contamination of clean water.	Throughout the plant operational phase	Rehabilitation objectives and standard Spill Procedure Approved IWWMP Approved Stormwater Management Plan GN704 Regulations in terms of the National Water Act, 1998 (Act No 36 of 1998)

ACTIVITY whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		In order to achieve these objectives, the following stormwater management measures must be implemented on the site to ensure that that potential stormwater impacts are kept to a minimum: • Clean and dirty stormwater needs to be separated. Dirty stormwater may not be released into the environment and should be contained and treated on site; • The operation and maintenance of the stormwater and waste water containment facilities shall be done in accordance with the requirements of the Integrated Water Use License and Integrated Water and Waste Management Plan (IWWMP); • Immediate reporting of any polluting or potentially polluting incidents so that appropriate measures can be implemented; • Fuel and oil spills shall be treated immediately by appropriate mop-up products. Several hydrocarbon absorption/remediation products (i.e. Spill kits) must be placed throughout the site. The approved spill procedure to be implemented; • Use of bunds or traps to ensure full containment of hydrocarbon and		

ACTIVITY whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		other hazardous materials are mandatory; • Any contaminated material is disposed of in an appropriate manner and the potential risks associated with such spills are limited; • Stormwater leaving the site must in no way be contaminated by any substance, whether such substance is a solid, liquid, vapour or gas or a combination thereof which is produced, used, stored, dumped or spilled on the premises; • All hazardous substances should be stored on impervious surfaces that allow for the containment of spills and leakages (e.g. bunded areas). Should spills occur, these should be reported to the Site Manager. • Liquid hazardous waste shall be contained and stored according to the prescribed measures; • Increased runoff should be managed using berms and other suitable structures as required to ensure flow velocities are reduced; and • Removal of spills, rainwater and waste produced during clean-up of the bunds – shall be done in		

ACTIVITY whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		accordance to relevant specifications; • Ensure good housekeeping practices.		
	Biodiversity	**Reduce loss of vegetation and fauna through management measures.** • Should the Southern African Python, Giant Bullfrogs or herpetological species be found, these should be relocated to a natural area. This is to be done by a suitably qualified herpetologist; • Environmental awareness training should include that no hunting, trapping or killing of fauna are allowed; • Any animals rescued or recovered will be relocated in suitable habitat away from the mining operations and associated infrastructure; • Any lizards, snakes or monitors encountered should be allowed to escape to suitable habitat away from disturbance. • No reptile should be intentionally killed, caught or collected during any phase of the project; and • General avoidance of snakes is the best policy if encountered. Snakes should not be intentionally harmed or killed and allowed free movement away from the area.	Throughout the plant operational phase	Alien and Invasive Species Management Plan Rehabilitation Objectives and Standards Alien and Invasive Species Regulations (Government Notice 598 of 2014) and Alien and Invasive Species List, 2014 in terms of NEMBA (Government Notice 599 of 2014) • Notice 2 Exempted Alien Species in terms of Section 66 (1) • Notice 3 National Lists of Invasive Species in terms of Section 70(1) – List 1, 3-9 & 11 • Notice 4 Prohibited Alien Species in terms of Section 67 (1) – List 1, 3-7, 9-10 & 12 Environmental Awareness Plan

ACTIVITY whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		• Any sensitive herpetofauna inadvertently killed during earth moving activities, should be preserved as museum voucher specimens; • Any stormwater cut-off channels should be kept as natural as possible with gentle slopes (45° angle or less) on the side away from mining activities. Channels should also have rough surfaces and rocks, less "curvature" on the walls to enable smaller animals to escape. A "step" in the slope of the walls and a "lip" on the edge of the channel will deter animals from entering the channels; • Only vegetation falling directly in demarcated access routes or project sites should be removed where necessary; • No further vegetation clearance except for the removal of alien invasive species will be allowed; and • All remaining indigenous vegetation should be conserved wherever possible.		
	Biodiversity	**Prevent and control alien vegetation from spreading through management measures.**	Throughout the plant operational phase	Alien and Invasive Species Management Plan Rehabilitation Objectives and Standards

ACTIVITY whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		• An alien vegetation management plan should be compiled and implemented; • Regular removal of invasive alien species should be undertaken. This should extend right through to the closure phase of the project; and • No spread of alien vegetation onto adjacent properties should be allowed.		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 2014)
	Biodiversity	**Conserve and / or restore migratory routes of fauna through management measures.** Reduce the levels of disturbance on areas indicated by the Environmental Control Officer (ECO) as migratory routes, if any.	Throughout the plant operational phase	Rehabilitation objectives and standards
	Aesthetic (Visual)	**Reduce visual impact through controlling management measures.** • Housekeeping on site should be enforced; • Install lights that will not create a night sky glow; • Restrict the activities and movement of workers and vehicles to the immediate site and existing access roads; • Ensure that waste materials are managed and removed regularly; • Ensure that all infrastructure and the site and general surrounds are maintained in a neat and appealing way; and	Throughout the plant operational phase	Visual Impact Assessment Mitigation Measures and Recommendations

ACTIVITY whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		• Reduce and control dust through the use of approved dust suppression techniques.		
	Noise and lighting	**Reduce noise disturbance/ increased level of noise through controlling measures.** • Silencers will be utilised where possible; • Heavy vehicle traffic should be routed away from noise sensitive areas where possible; • Noise levels should be kept within acceptable limits. All noise and sounds generated should adhere to South African Bureau of Standards (SABS) specifications for maximum allowable noise levels for construction sites. No pure tone sirens or hooters may be utilised except where required in terms of SABS standards or in emergencies; • With regard to unavoidable very noisy construction activities in the vicinity of noise sensitive areas, the Site Manager (SM) should liaise with local residents and how best to minimise impacts, and the local population should be kept informed of the nature and duration of intended activities; • The SM should take measures to discourage labourers from loitering	Throughout the plant operational phase	The South African National Standard SANS 10103:2008 Mine Health and Safety Act (Act 29 of 1996)

ACTIVITY whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		in the area, causing noise disturbance; • Noise impacts should be minimised by restricting the hours (between 06h00 and 18h00 on Monday to Friday, and 06h00 and 13h00 on Saturdays), during which the offending activities are carried out and, where possible, by insulating machinery and/or enclosing areas of activity; • Should any complaints be received, noise monitoring should be conducted and specialist recommendations implemented where possible; • Personal Protective Equipment to all persons working in areas where high levels of noise can be expected; Signs where it is compulsory; • Proper design of the plant areas and machinery where measures are taken to prevent noise generation such as silencers, mufflers and sound suppressing enclosures for parts/processes which can generate noise; • Regular inspections and maintenance of equipment, vehicles and machinery to prevent unnecessary noise;		

ACTIVITY whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		• Noise breaking barriers can be erected such as netting, walls or high growing trees; and • Placement of noise generating activities can be planned as far away as possible from affected areas or persons.		
	Noise and lighting	**Reduce light pollution through controlling measures.** • Unnecessary lights should be switched off during the day and / or night to avoid light pollution; • Install lights that will not create a night sky glow; • Mitigation of lighting impacts includes the pro-active design, planning and specification lighting for the facility by a lighting engineer; • Shielding the sources of light by physical barriers (vegetation, or the structure itself); • Limiting mounting heights of lighting fixtures by specifying foot-lights or bollard level lights; • Making use of minimum lumen or wattage in fixtures; • Making use of down-lighters or shielded fixtures; • Making use of energy efficient lighting or other types of low impact lighting.	Throughout the plant operational phase	Visual Impact Assessment Mitigation Measures and Recommendations

ACTIVITY whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		• If lighting is required, the lighting will be located in such a place and such a manner so as to minimise any impact on the surrounding community; and • Security lighting should be designed in such a way as to minimise emissions onto undisturbed areas on site and neighbouring properties. Light fittings should face downwards.		
	Air quality	**Reduce air and dust pollution through controlling measures.** • Dust suppression shall be implemented during dry periods and windy conditions; • Ensure that shortest routes are used for material transport; • Ensure that stockpile height is kept to a minimum and that any stockpiling occurs downwind of the stockpiles; • Minimise travel speed on paved roads (30 km/h); • Should any complaints be received, additional dust monitoring should be implemented for the waste rock beneficiation facility; • Implement monthly site inspection to check for possible areas of dust generation not addressed or not effectively managed;	Throughout the plant operational phase	South Africa National Standard 1929:2005: Ambient Air Quality: Limits for common pollution National Dust Control regulations, 2013, as published in the Government Gazette (No. 36974) of 1 November 2013 (GNR 827 of 1 November 2013), in terms of the National Environmental Management: Air Quality Act 39 of 2004 Approved dust fall monitoring programme

ACTIVITY whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		• Ensure minimum travel distance between working areas and stockpiles. • Ensure graded areas are sprayed with water. • Minimise the amount of graded areas. • Load and offload material, as far as possible, downwind of stockpiles.		
	Waste	**Control waste through management measures.** • The conditions of the Integrated Water Use License (IWUL) and the IWWMP must be implemented. • A central waste storage and transition area shall be established within the site; • The central waste storage and transition area shall be surfaced and demarcated appropriately; • Portable wheelie bins shall be placed throughout the site camp as well as at the remainder of the site and at all working areas; • Wheelie bins shall be colour coded and labelled to identify the waste stream for which it is intended; • All portable wheelie bins and other containers shall be emptied at the central waste storage and transition area a minimum of once a week as to avoid waste build up;	Throughout the plant operational phase	Approved IWWMP Waste Classification and Management Regulations and Norms and Standards for the assessment of for landfill disposal and for disposal of waste to landfill, 2013 (Government Notice 634 – 635 of 2013) promulgated in terms of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) [as amended] and: SANS 10234: 2008: Globally Harmonized System of classification and labelling of chemicals (GHS)

ACTIVITY whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		• The waste shall be removed (within 30 days) by a licensed waste service provider as shall be disposed of at a licensed waste landfill site and records of safe disposal (as required for hazardous wastes) shall be supplied to the Millsell operations. These records shall be kept on site by the ESM. • Wherever possible and practical, waste materials generated on site must be recycled.		
	Services	**Reduce use of natural resources through controlling management measures.** • Energy savings measures to be implemented at the mine, e.g.: ➢ No lights to be switched on unnecessarily. Only security lights to be switched on at night; • Energy saving bulbs to be installed; and • Water should be recycled as far as possible to avoid any additional water usage.	Throughout the plant operational phase	-
	Traffic	**Reduce change in traffic patterns through controlling management measures.** • Where feasible heavy vehicles should not operate on public roads during peak hours; and	Throughout the plant operational phase	Legal speed limits South African Road Signs Manual

ACTIVITY whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		• Heavy vehicles should adhere to the speed limit of the road.		
	Health and Safety	**Prevent accidents through controlling management measures.** • Drivers will be enforced to keep to set speed limits. • Trucks will be in a road-worthy condition. • Roads and intersections will be signposted clearly. Only main roads should be used; • Where feasible vehicles should not operate on public roads during peak hours; • Heavy vehicles should always travel with their head lights switched on; • Heavy vehicles should not stop on the road to pick up hitchhikers – No stopping on the road approaching the mine will be allowed; • Single directional traffic shall be controlled through a stop-go system or any other appropriate traffic control method; • Samancor shall be responsible for ensuring that suitable access is maintained for public traffic to all relevant businesses and properties; and • All traffic accommodation measures are to conform to the latest edition	Throughout the plant operational phase	Legal speed limits South African Road Signs Manual

ACTIVITY whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		of the South African Road Signs Manual.		
	Health and Safety	**Prevent fire through controlling management measures.** • All workers will be sensitised to the risk of fire; • Smoking is only allowed in designated smoking areas and dispose of cigarette butts safely in sand buckets; • The Applicant shall ensure that the basic fire-fighting equipment is available on the site; • Extinguishers should be located outside hazardous materials and chemicals storage containers; Fire response and evacuation • An Emergency Plan (including Fire Protection, Response and Evacuation Plan) is to be prepared by the Applicant and conveyed to all staff on the site; • Identify major risks to minimise the environmental impacts e.g., air pollution and contaminated effluent runoff.	Throughout the plant operational phase	Mine Health and Safety Act (Act 29 of 1996) An Emergency Plan (including Fire Protection, Response and Evacuation Plan) Veld and Forest Fire Act, 1998 (Act No. 101 of 1998) [as amended] • Section 12 (1) Duty of the landowner to prevent fire from spreading to neighbouring properties.
	Health and safety	**Prevent health and safety incidents through controlling management measures.** • A health and safety plan in terms of the Mine Health and Safety Act (Act 29 of 1996) should be compiled and	Throughout the plant operational phase	Health and safety plan in terms of the Mine Health and Safety Act (Act 29 of 1996

ACTIVITY whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		implemented to ensure worker safety; • A health and safety control officer should monitor the implementation of the health and safety plan for the operational phase; • Regular health and safety audits should be conducted and documented; and a record of health and safety incidents should be kept on site and made available for inspection; • Any health and safety incidents should be reported to the Site Manager (SM) immediately; • First aid facilities should be available on site at all times; • Workers have the right to refuse work in unsafe conditions; and • Material stockpiles or stacks should be stable and well secured to avoid collapse and possible injury to site workers.		
Maintenance of the crusher, screen, conveyors, cleaning magnet, and transfer chute	Groundwater Surface water	**Reduce and remedy siltation through controlling management measures.** • The Site Manager (SM) should ensure that excessive quantities of sand, silt and silt-laden water do not enter the stormwater system; • Appropriate measures, e.g. construction of silt traps, or drainage retention areas to prevent	Throughout the plant operational phase	Rehabilitation objectives and standards Approved IWWMP Approved Storm Water Management Plan GN704 Regulations in terms of the National Water Act, 1998 (Act No 36 of 1998)

ACTIVITY whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		silt and sand entering drainage should be taken; • No wastewater may run freely into any of the surrounding naturally vegetated areas; • The loss of topsoil must be minimised; • Erosion and subsequent siltation must be limited; • Any drainage channels shall be suitably designed to ensure that erosion does not occur; • All areas susceptible to erosion shall be protected and stabilisation measures implemented; • Packing of sandbags, gabions, straw bales or brush to reduce the speed of water flow where water is scouring the topsoil and results in the formation of erosion gullies; • Any surface runoff generated which has a high suspended solid content shall be collected at the point source in an appropriate containment facility, then be allowed to settle before discharge into the environment; and • A stormwater management plan must be compiled; and should be approved by DWS and implemented.		
Loading, hauling and transport of materials	Groundwater Surface water	**Prevent through controlling management measures.**	Throughout the plant operational phase	Rehabilitation objectives and standards

ACTIVITY whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		In accordance with Government Notice 704 (GN 704), the onsite management should: • Keep clean and dirty water separated; • Contain any dirty water within a system; and • Prevent the contamination of clean water. In order to achieve these objectives, the following stormwater management measures must be implemented on the site to ensure that that potential stormwater impacts are kept to a minimum: • Clean and dirty stormwater needs to be separated. Dirty stormwater may not be released into the environment and should be contained and treated on site; • The operation and maintenance of the stormwater and waste water containment facilities shall be done in accordance with the requirements of the Integrated Water Use License and Integrated Water and Waste Management Plan (IWWMP); • All temporary storm water infrastructure (if any) on-site shall be maintained and kept clean throughout the construction period;		Approved IWWMP Approved Storm Water Management Plan GN704 Regulations in terms of the National Water Act, 1998 (Act No 36 of 1998)

ACTIVITY whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		• Immediate reporting of any polluting or potentially polluting incidents so that appropriate measures can be implemented; • Fuel and oil spills shall be treated immediately by appropriate mop-up products. Several hydrocarbon absorption/remediation products (i.e. Spill kits) must be placed throughout the site; • Use of bunds or traps to ensure full containment of hydrocarbon and other hazardous materials are mandatory; • Any contaminated material is disposed of in an appropriate manner and the potential risks associated with such spills are limited; • Stormwater leaving the site must in no way be contaminated by any substance, whether such substance is a solid, liquid, vapour or gas or a combination thereof which is produced, used, stored, dumped or spilled on the premises; • All hazardous substances should be stored on impervious surfaces that allow for the containment of spills and leakages (e.g. bunded areas). Should spills occur, these should be reported to the Site Manager;		

ACTIVITY whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		• Liquid hazardous waste shall be contained and stored according to the prescribed measures; • Increased runoff should be managed using berms and other suitable structures as required to ensure flow velocities are reduced; and • Removal of spills, rainwater and waste produced during clean-up of the bunds – shall be done in accordance to relevant specifications.		
Dust Suppression	Air Quality	**Prevent loss of natural resources (groundwater) for dust suppression.** Water should be recycled as far as possible to avoid any groundwater abstraction.	Throughout the plant operational phase	-
Storage of raw material and product stockpiles	Surface water Groundwater	**Reduce and control groundwater pollution through management measures.** • Mine management will develop rehabilitation plans. After the plans are approved by the competent authority, they will be implemented. Monitoring and modelling of the groundwater will continue until a closure certificate is issued; • The closure strategy will be re-assessed to determine containment, treatment and/or re-use options through the monitoring and calibration of the groundwater	Throughout the plant operational phase	Rehabilitation Objectives and standards Groundwater monitoring plan Department of Water and Sanitation Water Quality limits SANS 241: 2011 Standard for Drinking Water

ACTIVITY whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		model during the operational phase; and • Should monitoring results indicate potential decant or confirm the formation and movement of a pollution plume in the shallow aquifer, management, containment or treatment measures will be implemented to prevent impact on the receiving surface water and groundwater environment.		
Closure and Post-Closure Phases	Refer to the above impacts during the operational phase.	Please refer to the above mitigation measures.	Throughout the plant operational phase	Please refer to the above standards

i) Financial Provision

(1) Determination of the amount of Financial Provision.

(a) Describe the closure objectives and the extent to which they have been aligned to the baseline environment described under the Regulation.

The closure objectives in the existing EMPR for the Samancor Millsell / Waterkloof Mine, will be applicable to the proposed Community Waste Rock Beneficiation Facility. These include:

Management objectives

The objective for closure of the section is to create a free draining post mining landscape that has been returned to a productive post mining land use. The land use is likely to be primarily wilderness with the potential for arable agriculture and livestock grazing.

No new fixed infrastructure will be established on closure and all existing infrastructure will be removed.

The closure objective regarding groundwater is zero discharge of contaminated water to the environment.

Management measures

The broad approach to closure of the site is detailed in the existing approved environmental management programme. Samancor (WCM) Millsell - Waterkloof Section will develop a detailed closure plan at least two years before cessation of mining detailing how they plan to finalise closure of the site.

(b) Confirm specifically that the environmental objectives in relation to closure have been consulted with landowner and interested and affected parties

The Environmental Objectives in relation to closure in the existing approved EMPR was subjected to a public consultation process. This Basic Assessment Report and Environmental Management Programme were also subjected to a public consultation period, whereby I&APs were given 30 days to comment.

(c) Provide a rehabilitation plan that describes and shows the scale and aerial extent of the main mining activities, including the anticipated mining area at the time of closure

Rehabilitation measures and plan for the expansion of the Community Waste Rock Beneficiation Facility is part of the existing closure and rehabilitation plan for the Samancor Millsell / Waterkloof Mine.

(d) Explain why it can be confirmed that the rehabilitation plan is compatible with the closure objectives.

The rehabilitation plan will assist the applicant to meet closure objectives (contained in the existing EMPR for the Samancor Millsell / Waterkloof Mine), which will also be applicable to the proposed Commuinity Waste Rock Beneficiation Facility.

These include:

Management objectives

The objective for closure of the section is to create a free draining post mining landscape that has been returned to a productive post mining land use. The land use is likely to be primarily wilderness with the potential for arable agriculture and livestock grazing.

No new fixed infrastructure will be established on closure and all existing infrastructure will be removed.

The closure objective regarding groundwater is zero discharge of contaminated water to the environment.

Management measures

The broad approach to the closure of the site is detailed in the existing approved environmental management programme. Samancor (WCM) Millsell - Waterkloof Section will develop a detailed closure plan at least two years before cessation of mining detailing how they plan to finalise closure of the site.

(e) Calculate and state the quantum of the financial provision required to manage and rehabilitate the environment in accordance with the applicable guideline.

The quantum of the financial provision required to manage and rehabilitate the environmenta will be provided in the FBAR to be submitted to the Competent Authority.

(f) Confirm that the financial provision will be provided as determined.

It is confirmed that the financial provision for rehabilitation and closure requirements, is reviewed annually for sufficiency and will be amended to include requirements for new activities. During the annual review, confirmation will be provided that this amount can be provided for from operating expenditure.

Mechanisms for monitoring compliance with and performance assessment against the environmental management programme and reporting thereon, including

f) Monitoring of Impact Management Actions

g) Monitoring and reporting frequency

h) Responsible persons

i) Time period for implementing impact management actions

j) Mechanism for monitoring compliance

Table 25: Mechanisms for monitoring compliance with and performance assessment against the environmental management programme and reporting thereon, including

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
Construction of crusher, screen, conveyors, cleaning magnet, and transfer chute	Water Quality Monitoring in terms of WUL (REF: 27/2/2/A822/12/1)	The current water quality monitoring plan must be maintained. (Please refer to the water monitoring report attached as ***Appendix 9.*** Water Sampling Techniques The following water sampling techniques is recommended: • Guidance on the preservation and handling of water samples SANS 5667-3:2006/ISO 5667-3:2003 (SABS ISO 5667-3) • Guidance on sampling from lakes, natural and man-made SANS 5667-4:1987/ISO 5667-4:1987 (SABS ISO 5667-4)	Environmental Specialist	QUATERLY (GROUNDWATER QUALITY) MONTHLY (SURFACE WATER QUALITY)

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
		• Guidance on sampling of drinking water from treatment works and piped distribution systems SANS 5667-5:2006/ISO 5667-5:2006 (SABS ISO 5667-5) • Guidance on sampling of rivers and streams SANS 5667-6:2006/ISO 5667-6:2005 (SABS ISO 5667-6) • Guidance on sampling of waste waters SANS 5667-10:2007/ISO 5667-10:1992 • Guidance on sampling of groundwater SANS 5667-11:1993/ISO 5667-11:1993 (SABS ISO 5667-11) • Guidance on sampling of sludges from sewage and water treatment works SANS 5667-13:2007/ISO 5667-13:1997 • Guidance on quality assurance of environmental water sampling and handling SANS 5667-14:2007/ISO 5667-14:1998		
	Dust and Air Quality Pollution	The current air quality monitoring plan must be maintained. (Please refer to the water monitoring report attached as ***Appendix 9*** Dust shall be controlled in accordance with the requirements of the National Dust Control Regulations (GN 827, November 2013). This	Environmental Specialist	MONTHLY

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
		shall include compliance with regards to: A: Dust fall out standards- (b) 1200 mg/m2/day averaged over 30 days in areas other than residential and light commercial areas measured using reference method ASTM 01739. • A Gravimetric Dust Monitoring program must be implemented on the site as stipulated in section 4 of GN 827 – National Dust Control Regulations, in terms of section 53(o), read with section 32 of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004).		
	Spreading of alien invasive vegetation and impacts on habitat and vegetation.	Specialist monitoring on Faunal and Floral aspects include the monitoring of effects operational processes have on vegetation and accompanied animal life within the immediate or surrounding areas of the operations. • Alien vegetation control and management; • Habitat and vegetation management; • Rehabilitation services include the rehabilitation of operational disturbed areas and hydrocarbon spill areas; • Sloping and re-vegetation of disturbed area to surrounding landscape; and • Remediation of soil at spill sites.	Environmental Specialist	Visual inspections during all phases of the activities.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
Stockpiling of raw material **Operation** of crusher, screen, conveyors, cleaning magnet, and transfer chute Stockpiling of product (Ready-mix concrete, Pre-bagged products, Stope support systems for the mining industry, Precast walling, Kerbs and edging)	Monitoring during the OPERATIONAL phase will be the same as during the construction phase.			
Decommissioning and Closure	Monitoring during the CLOSURE AND POST CLOSURE phase will be the same as during the construction phase.			

k) Indicate the frequency of the submission of the performance assessment report.

A Performance Assessment Review of the EMPR should be conducted biennually (once every two years) and the environmental audit report will be submitted annually (once every year).

l) Environmental Awareness Plan

(1) Manner in which the applicant intends to inform his or her employees of any environmental risk which may result from their work.

The Environmental Awareness Plan that was part of the existing approved Environmental Management Programme for the Samancor Millsell / Waterkloof Mine will be applicable to the proposed activities. Please refer to the existing approved EMPR.

(2) Manner in which risks will be dealt with in order to avoid pollution or the degradation of the environment.

The procedure for dealing with environmental risk including the objectives, identification and calculation of environmental risks is described in the existing approved EMPR.

m) Specific information required by the Competent Authority

(Among others, confirm that the financial provision will be reviewed annually)

The financial provision for the Samancor Millsell / Waterkloof Mine will be reviewed annually. No specific information has been required by the Competent Authority at this point in time.

2) UNDERTAKING

The EAP herewith confirms

a) the correctness of the information provided in the reports ☒

b) the inclusion of comments and inputs from stakeholders and I&APs ; ☒

c) the inclusion of inputs and recommendations from the specialist reports where relevant; ☒and

d) the acceptability of the project in relation to the finding of the assessment and level of mitigation proposed; ☒

REFERENCES

ACOCKS, J.P.H. 1988. Veld Types of South Africa. Bot. Surv. S. Afr. Mem. No 57.

Badenhorst, H. 2015. Ecological Scan for the proposed expansion of the Tailings Storage Facility and Waste Rock Dump at Samancor Chorme LTD.'s Millsell Mine, Kroondal, North West Province. Environmental Assurance.

Bojanala Platinum District Municipality Integrated Development Plan 2018/2019.

COASTAL AND ENVIRONMENTAL SERVICES, 1999: Rating the Severity and Significance of Environmental Impacts.

Coetzee, T. 2015. Phase 1 Archaeological Impact Assessment for Environmental Assurance (Pty) Ltd on a portion of portion 410 of the farm Waterkloof 305 JQ, Rustenburg, North West.

DEPARTMENT OF ENVIRONMENTAL AFFAIRS AND TOURISM: Integrated Environmental Management Information Series: Impact Significance

Mavurayi, A. 2015. Geohydrological Impact Assessment for the Proposed New Tailings Dam and Extension of the Rock Dump at Millsell Section, in Terms of the National Water Act of 1998 (Act No. 36 of 1998). Water Without Frontiers.

North West Planning Commission. Provincial Development Plan 2030. 2013.

Nortje, J.P. 2015. Air Quality Baseline Report for the proposed expansion of the TSF and waste rock dump at Samancor Chrome Ltd.'s Millsell Mine, Kroondal, North West Province for Portion 410 of the Farm Waterkloof 305 JQ. Environmental Assurance.

Nortje, J.P. 2015. Visual Impact Assessment for the proposed expansion of the Tailings Storage Facility and Waste Rock Dump at Samancor Chrome Ltd.'s Millsell Mine, Kroondal, North West Province. Environmental Assurance.

Rustenburg Local Municipality. Integrated Development Plan. 2018.

Schoeman, C.S. 2015. Noise Baseline Report for the proposed Tailings Storage Facility and Waste Rock Dump at Samancor Chrome Ltd.'s Millsell Mine, Kroondal, North West Province. 2015. Environmental Assurance.

Western Cape Department of Environmental Affairs & Development Planning (WC DEADP) Guideline on alternatives: EIA Guideline and Information Document Series (2011).

Western Cape Department of Environmental Affairs and Development Planning's (WC DEADP). *Guideline on Need and Desirability: EIA Guideline and Information Document Series* (2011).

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