An EOH Company

SMOKEY HILLS MINE STORMWATER MANAGEMENT AND ASSOCIATED INFRASTRUCTURE: DRAFT EIA&EMPR

LP30/1/2/3/2/1/069 EM

Technical Report: **ES16-134_DEIA**

Prepared for: **Department of Mineral Resources**

Prepared by: **Exigo Sustainability (Pty) Ltd**

mineral resources
Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT

And

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

PROPOSED SMOKEY HILLS PLATINUM MINE STORMWATER MANAGEMENT AND ASSOCIATED INFRASTRUCTURE

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

NAME OF APPLICANT: Phokathaba Platinum (Pty) Ltd
CONTACT PERSON: Rodney O'Reilly
TEL NO: 083 296 1875
FAX NO: 013 230 7450
POSTAL ADDRESS: Postnet Suite 208, Private Bag X7S, Bryanston, 2021
PHYSICAL ADDRESS: Smokey Hills Mine, Farm Maandagshoek, Steelpoort, Limpopo
FILE REFERENCE NUMBER SAMRAD: Not submitted via SAMRAD
DMR REFERENCE NUMBER: LP30/5/1/2/3/2/1/69 EM

SMOKEY HILLS MINE PROPOSED STORMWATER MANAGEMENT AND ASSOCIATED INFRASTRUCTURE:

DRAFT EIA&EMPR

26 June 2017

Prepared for:

Department of Mineral Resources

Compiled by:

Herman Gildenhuys *B.Sc. Hons. Wildlife Management Pr. Sci Nat*

Catherine da Camara *Pri.Sci.Nat, BSc. Hons (Animal, Plants and Environmental Sciences)*

IMPORTANT NOTICE

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

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

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

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

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

OBJECTIVE OF THE 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.

TABLE OF CONTENTS

List of Tables

List of Figures

Executive Summary (English)

1. Introduction

Smokey Hills Mine, also known as the Phokathaba Platinum Mine, has applied to receive environmental approval from the Department of Mineral Resources (DMR) for new infrastructure that is proposed to be constructed at the mine. The original proposal consisted of extending the existing opencast pits on site, as well as obtaining approval for new Pollution Control Dams and associated infrastructure on site.

The mine has however decided **not to go ahead with opencast mining**. Once the mine again becomes operational only the underground mining section will be reopened. This report therefore only describes to the proposed new stormwater management infrastructure (PCDs) and existing infrastructure on site.

2. Background

The mine is located on the farm Maandagshoek 254 KT within the Fetakgomo-Greater Tubatse Local Municipality. The mining activities are authorized in terms of the Mineral and Petroleum Resources Development Act (No 28 of 2002) (MPRDA). The Environmental Management Programme for the mine was approved by the DMR on 13 November 2007. Infrastructure establishment subsequently commenced and the mine produced its first concentrate in March 2009. The mine is currently not operational as adverse local and global economic and market circumstances led to the mine being placed in care and maintenance at the end of March 2016. The mine also has an Integrated Water Use Licence (IWUL) that was issued on 2 March 2012.

Phokathaba Platinum holds mineral rights over the property for the mining of Platinum Group Metals (PGM). The surface rights of the farm Maandagshoek 254 KT are held by the National Government of the Republic of South Africa. Mining originally started as opencast operations whereafter the opencast areas were used to gain access to underground. Mining operations is centres around two hills, with 3 Adits at each hill. The report provides an overview of the infrastructure on site, and also highlights the infrastructure approved in the original EMPR that was not constructed due to a design change (e.g. Return Water Dam).

3. Proposed project

As mentioned above, the original proposal consisted of extending the existing opencast pits on site, as well as obtaining approval for new Pollution Control Dams and associated infrastructure on site. The mine has however decided **not to go ahead with opencast mining**.

The mine's storm water management plan (SWMP) was recently updated order to ensure that stormwater is adequately managed on site Two Pollution Control Dams (PCD's) and one Evaporation dam (serving as a PCD) are proposed. PCD1 (50 000 m^3 capacity) is proposed directly to the south of the existing mining area, while PCD2 (25 000 m^3 capacity) will collect storm water from the plant, ROM stockpile, workshops and associated facilities. The stormwater management plan submitted as part of the approved EMPR for the mine (AGES, 2007), as well as the approved Water Use Licence (WUL)

provides for a PCD of 15 000 m^3 between the plant and the tailings dam. The proposal is therefore to increase the capacity of the dam from 15 000 m^3 to 25 000 m^3. An Evaporation Dam is also proposed for water that naturally collects inside an existing open pit on Hill 2. No formal structure will be built, but the lowest part of the pit will be sealed in order to prevent water ingress into the groundwater system. Water will naturally evaporate from this dam. The catchments, PCDs, stormwater channels, silt traps and stormwater management around the TDF are indicated in Drawing Number 1759/VV/04SwMp included as part of the Stormwater Management Plan attached as Appendix 9.2 of the report.

5. Need and Desirability

The Department of Water and Sanitation (DWS) requires the mine's to separate clean and dirty storm water under Regulation GN704. On-going consultations with DWS have confirmed the DWS required the mine to manage its storm water more effectively. The proposed Pollution Control Dams and associated infrastructure will improve water management at the mine and ensure the protection of the environment and water resources.

6. Alternatives

Location Alternatives - Location of PCD2:

The site initially considered for the placement of Pollution Control Dam 2 (PCD2) was within a small drainage line, since it was the lowest point in the area. Upon recommendation from the project ecologist the PCD was moved to a site approximately 100m away adjacent to the drainage line to a less ecologically sensitive area.

Stormwater Design Alternatives:

Two alternatives were originally considered for collecting stormwater from the plant and adjacent areas:

1. Existing Tailings Dam pool to be used for storm water containment
2. Separate Pollution Control Dam to be constructed (PCD2 referred to above)

After consultation with the DWS the mine however opted for the more conventional approach in that a separate Pollution Control Dam (PCD2) with a capacity of 25 000 m^3 is proposed to be constructed.

No-Go Alternative:

In the event that the proposed PCD's are not constructed the status quo will be maintained. The purpose of the construction of the PCD's is to allow for the separation of clean and dirty water as required by GN 704. If the PCD's are not developed this will result in negative impacts on water quality as the existing dirty water management infrastructure will not be sufficient to prevent the release of dirty water in the future.

7. Public Participation

The draft Environmental Impact Report (EIR) and Environmental Management Programme (EMPR) is currently out for public review and the comments received will be included in the final EIR & EMPR to be submitted to the Department of Mineral Resources.

8. Specialist Findings and Impact Significance Ratings

The following is a summary of the specialist findings:

Soil, Land use and Land Capability:

- The site has a low potential for arable agriculture considering the climatic conditions and shallow soils.
- The land capability of the site is mostly restricted to wildlife grazing due to the shallow and often sandy nature of the soils and location of pockets of seasonally wet soils in some areas. The potential impacts associated with the proposed development are soil disturbance (erosion, compaction), loss of land capability, soil destruction and sterilisation and soil pollution (spillages).

Fauna and Flora:

- Vegetation clearing and topsoil stripping will impact the flora and fauna of the area during the construction phase of the dams. Vegetation will be cleared and fauna will need to migrate to neighbouring areas.
- Indirect impacts can include soil erosion, fauna mortalities, spillages and establishment of alien invasive species; although with strict implemented of the mitigation measures and action plans for the various components, the impacts can be minimized.
- The proposed development can be considered as viable, although strict mitigation and monitoring will need to be implemented to keep impacts to a minimum.

Heritage:

- No heritage resources were documented within the proposed PCD footprints.

Surface and Groundwater:

- The Geohydrological Impact Assessment for the mine took into account the existing infrastructure (in particular the Tailings Disposal Facility) as well as the proposed PCD's. In essence the proposed PCDs will have a positive impact on ground and surface water resources as it will assist the mine to contain water on site that has been in contact with mining activities / infrastructure.

Mitigation measures are provided in the report for the mentioned impacts and provided this management and rehabilitation measures stipulated in the report are strictly adhered to, the specialists agree that the proposed development can be supported. The negative impacts associated with the development can be mitigated to negligible or low levels of significance. The only impact of moderate significance identified is that of Habitat degradation due to dust created from vegetation clearing and/or vehicle movement during the construction phase. The impact on ground and surface water resources is expected to be positive as the proposed PCDs will prevent groundwater and surface water contamination.

9. Way Forward

- Draft EIA&EMPR published: The draft EIA&EMPR will be circulated to registered I&APs for comment for a period of 30 days.
- Revise Draft EIA&EMPR: The draft report will be updated by addressing and responding to the issues raised in by I&APs.
- Final EIA&EMPR. The revised final report will be published with the various specialist reports appended. This will be submitted to the Department of Mineral Resources (DMR).

Executive Summary (Sepedi)

1. Matseno

Smokey Hills Mine, yeo e tsebegago ka leina la Phokathaba Platinum Mine, e dirile dikgopelo tša go hwetša tumelelo ya tikologo go tšwa go ba Department of Mineral Resources (DMR), tša meago ye meswa yeo e šišintswego go agwa mo maeneng. šišinyego yeo e akaretšago le go tšwetša moepo yoo o le go gona mo maeneng, e akaretša le go hwetša tumelelo ya go aga matamo a go laola tšhilafatšo ya tikologo yeo e amaganago le meago yeo e le go gona. Moepo o tšeere sephetho sa gore o ka se tšwele pele le moepo yoe o šetšego o le gona. Ge moepo o thoma go šoma gape, go tla bulwa feela moepo waka fase ga mabu.Tšebiso ye e hlaloša fela šišinyo ye ntshwa ya taolo ya meago ya stormwater (PCDs) le yeo e le gona.

2. Mo re tšwago gona

Maene o hlomilwe mo polaseng ya Maandagshoek 254 KT ka gare ga Fetakgomo-Greater Tubatse Local Municipality. Mešomo yeo e dirwago ka mo maeneng e ka fase ga pušo ya mineral and Petroleum Resources Development Act (No 28 of 2002) (MPRDA). Taolo ya lenanego la tikologo e dumeletšwe ke ba DMR ka la 13 November 2007. Moago o ile wa thomišwa,maene wa tšweletša konkoriti ya wona ya mathomo ka la March 2009. Moepo ga o šome ka se sebaka ka ge maemo a ekonomi le tša mebaraka di dirile gore moepo o begwe ka fase ga hlokomelo le tsošološo mafelelong a March 2016. Moepo o na le laesense ya go šomša meetse yeo o e hweditšwego ka la 2 March 2012.

Phokathaba Platinum e na le di tokelo tša go diriša meago go epa polatinamo. Ditokelo tša go diriša polase ya Maandagshoek 254 KT di swere ke ba National Government of the Republic of South Africa. Moepo ge o thoma mathomong o thomile ka moepo wa go bolega ka morago melete yeo ya go bolega e ile ya dirišwa bjale ka menyako ya go tsena meepong ya ka fase.mešomo ya meepo e dirlwa mo bogare ga meboto e mebedi le menga e meraro mo mmotong o mongwe le o mongwe. Tšebiso ye e hlaloša ka boripana meago yeo e le go gona mo moepong, le go tsebagatša meago yeo re hweditšego tumelelo mo EMPR ya mathomo yeo e ilego ya se tšwele pele ka lebaka la go fetola sebobego

3. Porojeke yeo e šišintšwego

Ka ge go hlalošitšwe ka mo godimo, šišinyo ya mathomo e be e akaretša go oketša molete wa go bulega yoo o šetšego o le gona le go hwetša tumelelo ya go aga letamo le leswa la taolo ya tšhilafatšo ya naga yeo e amaganago le meepo yeo e le go gona. Moepo o tšeere sephetho sa go se tšwele pele ka goepa molete yoo wa go bulega.

Taolo ya moepo ya polane ya stormwater e tlalleditšwe malobanyana e le ge re nyaka go kgonthišiša gore meets a go tšwa ka maatla a laolwa botse mo matamong a taolo ya tšhilafatšo ya naga a mabedi le le le tee la go moyafatša, ao a šišintšwego.PCD1 (50 000 m^3 capacity) e šišintšwe bosubela tšatši ba molete wo o le go gona.PCD2 (25 000 m^3 capacity) yona e tla tšea stormwater go tšwa mo moleteng, ROM stockpile, di wekeshopongle meago ya go amagana le tšona.Taolo ya polane ya

stormwater e isitswe bjalo ka karolo ya tumelelo ya EMPR ya moepo (AGES, 2007), le tumelelo ya laesense ya tšhomišo ya meetse yeo e a tšhelago PCD of 15 000 m^3 magareng a moepo le letamo la go fetiša le go aroganya. šišinyego ye e le go gona ke ya koketšo ya letamo go tšwa go The 15 000 m^3 go ya go 25 000 m^3. Le letamo la moyafatšo le šišinyeditšwe meetse a o a kgobokanagoka gare ga molete wa go bulega mo mmotongwa bobedi. Ga gona moagowa semolao woo o tlogo agwa moo, E fela molete o tlo thibiwa ko fase go thibela meetse go ya moepong wa ka fase ga mobu. Meetse a tla moyafala go tšwa mo letamong leo. Di akaretša, PCDs,menga ya stormwater, moo meetsi a swarwago gona,le taolo ya stormwater mo TDF di bontšhitšwego mo Drawing Number 1759/VV/04SwMp di akaretšwa bjalo ka karolo ya taolo ya polane ya storm water yeo e kgomareditswego mo go appendix 9.2 ya tšebiso ye.

5. dihlokwa le di tumo

Ba Department of Water and Sanitation (DWS) ba nyaka gore moepo o aroganye meetse a go hlweka le a ditšhila ka fase ga molao wa GN704. Tšwelopele ya go ikgokaganya le ba DWS e kgonthišišitše gore DWS e nyaka moepo o laola ga botse meetse a bona a go tšwa ka maatla. Matamo a moyafatšo ya meetse le meago ya go elana le ona e tla kaonafatša taolo ya meetse mo moepong ya ba ya netefatša tšhireletšo ya tikologo le ditirišo tsa meetse.

6. Tsela te dingwe

Mafelo a mangwe – lefelo la PCD2:

Lefelo leo pele akanyetšwa go ba moo o ka beiwago letamo la taolo ya ditšhilafatša naga la bobedi le ka gare ga lefelo le lennyane la go ntša ditšhila, ka ge le be le le mo fase fase ga lefelo leo. Ka morago ga dišišinyo tse di dirilego ke ecologist ya porojeke, PCD e ile ya tloša go išwa lefelong leo le le go tekano ya 100m go tša lefelong la go ntša ditšhila.

Sebopego sa stormwater

Gona le ditsela tše pedi tšeo di išeditšwego hloko tša go akaretša meetse a go tšwa ka maatla mo moepong le mafelong a mangwe .:

3. Matamo a go fetiša ao a tlogo šomišwa go tshwara meetse a o a tšwago ka maatla.
4. Matamo a go aroganya taolo ya tšhilafatšo ya naga ao a šwanetšego go agwa (PCD2 yeo e bontšhitšwego ka godimo)

Ka morago ga go ikgokaganya le ba DWS. Moepo o ile wa tšea tsela ya gore letamo la go aroganya taolo ya tšhilafatšo ya naga la go lekana 25 000 m^3 le šišinywe go agiwa.

Ditsela tšeo re ka se di dirišego:

Ge o ka direga gore matamo a a šišintšwego a se agwe re tla lwela go tšwetša pele maemo a. mohula wa matamo a ke go kgona go aroganya meetse a go hlweka le a ditšhila go ya ka molao wa GN 704. Ge matamo a a kase agwe a ka ama hlwekišo ya meetse ka tsela ye e sego ya maleba, ka ge meago ya go laola meetse a ditšhila yeo e le go gona e ka se lekane go thibela gontsha meetse a ditšhila go ya pele

7. Karolo ya setšhaba

Rephote ya kamo ya tikologo le lenaneo la go laola tikologo di šetše di ntšheditswe ka ntle gore setšhaba se di lekole, le di šišinyo tšeo di tlo go go dirwa di tlo lokelwa ka gare ga Rephotho ya mafelelo ya kamo ya tikologo yeo e išwago go ba Department of Mineral Resources.

8. Setsebi se hweditše tše di latelago ka bohlokwa ba di ratings

Ka boripana setsebi se hweditšwe tše di latelago:

Mabu, tšhomišo ya naga le bogolo ba naga:

- Lefelo le le le go gona ga lena temo ya go kgotsofatša re lebeletse le boemo ba meso le mabu ao a se nago temo..
- Sekgala se sentšhi sa lefelo ke sa go fudisha diruiwa go lebeletšwe gore mabu a gona le mohlaba. Di šišinyego tse di rirwago di ka ama tshwenyo ya mabu le go lahlegelwa ke tšhomisho ya lefelo le tshenyo ya mabu le tšhilafatšo ya mabu.

Fauna and Flora:

- Go ntša Mehlare le mabu a ka godimo go tla ama flora le faunaya lefelo leo ge o agiwa matamo.mehlare ge e tloša fauna e tla tšhabela mafelong a kgauswi.
- dikamo tše dingwe di ka akaretša tshenyo ya mabu,go bolaya fauna le go tliša dihlare tša go tšwa mafelong a mangwe, le ge gona le metheo yeo e beilwego kamo ya mehlare e tla kaonafatšwa..
- šišinyego yeo e dirilwego e a kgonagala le ge go to hlokega taolo le tshepedišo di be gona gore di fokotše dikamo tše di k aba go gona.

Bohwa:

- Ga gona bohwa bjoo bo loketšwe mo didokhumenteng tseo di šišintšwego.

Kamo ntle le meetse a go tswa:

- Teko ya kamo ya Geohydrological ya moepo e etse hloko meago yeo e le go gona le matamo aoa šišinywago. a tlo ba le kamo ye botse mo mabung ke meetse a ka godimo ka ge e tla thuša moepo go tshwara meetse mo lefelong le amanago le tša moepo le meago ya gona.
- Taolo ya phokotšo e hlaloshitswe ka mo rephothong ya dikamo tse di boletšwego le taolo le dithibelo di latetšwe mo rephothong ye, le ditsebi di dumelelana le šišinyo ye. Dikamo tše dimpe tšeo di amanago le šišinyo ye di ka fokotšwa go išwa maemomg a go se bonagale. Kamo yeo e lego gore ke ya bohlokwa yeo e bontšhitšwego mo ke ya go ama badudi ka lerole leo le tlo tšwago goe go tloša dihlare le difatanaga tšeo di to go go dirišwa ge go agiwa. Meetse a ka se amege ka tsela ye mpe ka ge matamo a tlo a šireletsa gore a se ke a tšhilafala.

9. Tšwelopele

- Draft ya EIA&EMPR yeo e gatišitšwego: e tla sepetšwa go di I&APs tseo di lego molaong go

kwa dikakanyo lebakeng la matšatši a 30.

- Revise Draft EIA&EMPR: draft report e tla tlalletšwa ka go fetola dinhla tšeo di ntšhago ke I&APs.
- EIA&EMPR ya mafelelo. E tla gatišwa le direphotho tsa di tsebi tsa go fapana. E tla išwa go ba Department of Mineral Resources (DMR).

SCOPE OF ASSESSMENT AND ENVIRONMENTAL IMPACT ASSESSMENT REPORT

1. CONTACT PERSON AND CORRESPONDENCE ADDRESS

1.1. Details of Exigo Sustainability (Pty) Ltd

1.1.1. Details and Expertise of the EAP

Name of The Practitioner: Herman Gildenhuys

Tel No.: 012 751 2160

Fax No. : 086 607 2406

E-mail address: herman@exigo3.com

1.2. Expertise of the EAP

1.2.1. The qualifications of the EAP

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

Please also refer to Appendix 1: EAPs Qualifications.

Herman Gildenhuys

B.Sc. Hons. Wildlife Management Pr. Sci Nat

Catherine da Camara

Pri.Sci.Nat, BSc. Hons (Animal, Plants and Environmental Sciences)

1.2.2. Summary of the EAP's past experience

(Attach the EAP's curriculum vitae as **Appendix 2**)

Please refer to Appendix 2: Company Profile .

Herman Gildenhuys

10 years

Catherine da Camara

14 years

2. DESCRIPTION OF THE PROPERTY

Table 1: Property Details

Farm Name:	Farm Maandagshoek 254 KT
Application area (Ha)	The Farm Maandagshoek 254 KT is 4277.1796 ha in extent, the mining lease area is 1135 hectares and the proposed development area is approximately 19 hectares.
Magisterial district:	Sekhukhune District Municipality
Distance and direction	The mining site is situated approximately 32 km north-north-west of Burgersfort

from nearest town	
21 digit Surveyor General Code for each farm portion	T0KT00000000025400000

3. LOCALITY MAP

(show nearest town, scale not smaller than 1:250000 attached as Appendix 3).

Please refer to Appendix 3: Locality Map.

4. DESCRIPTION OF THE SCOPE OF THE PROPOSED OVERALL ACTIVITY

4.1. Listed and specified activities

Provide 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 and attach as **Appendix 4.**

Please refer to Appendix 4: Site Plan.

Table 2: Listed activities to be authorised

NAME OF ACTIVITY (E.g. **For prospecting -** drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route **etc…etc…etc** E.g. **for mining**,- excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)	**Aerial extent of the Activity Ha or m²**	**LISTED ACTIVITY** (Mark with an **X** where applicable or affected).	**APPLICABLE LISTING NOTICE** (***GNR 544, GNR 545 or GNR 546)***	**WASTE MANAGEMENT AUTHORISATION** (Indicate whether an authorisation is required in terms of the Waste Management Act). **(Mark with an X)**
Storm water on site will be directed via channels to a Pollution Control Dam in order to ensure the separation of dirty and clean water.	0.4 ha	X	GN 983 – NEMA Listing Notice 1 of 2014 Activity 9	
Indigenous vegetation will be cleared where the pollution control dams will be constructed.	2 ha	X	GN 983 – NEMA Listing Notice 1 of 2014; Activity 27	
The construction of the Pollution Control Dams will require an amendment to the Water Use Licence.	2 ha	X	GN 984 – NEMA Listing Notice 2 of 2014 Activity 6	
A pollution control dam with a height of more than 5 metres is proposed.	1.5 ha	X	GN 984 – NEMA Listing Notice 2 of 2014 Activity 16	

The **following listed activities** were applied for in the original EIA Application but **does not require authorisation anymore** as a result of the **reasons stated below**:

- GN 983 – NEMA Listing Notice 1 of 2014; Activity 12 for the authorisation of a stormwater channel that will cross a drainage line between the plant and the tailings dam for water to be transported to the tailings dam. Stormwater will not be directed to the tailings dam anymore. The preferred alternative is to construct a new PCD.
- GN 983 – NEMA Listing Notice 1 of 2014; Activity 19 for the authorisation of infilling of more than 5m3 into a watercourse. The original location for the PCD was within a drainage line; however the PCD was moved next to the drainage line on recommendation by the ecologist.
- GN 921 – NEMWA Category B, Activity 7 is also not required to be authorised as with the removal of the opencast and overburden dumps from the scope of the EMPR a waste management licence is not required anymore.

5. DESCRIPTION OF THE ACTIVITIES TO BE UNDERTAKEN

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

5.1. Background

The Smokey Hills Mine, also known as the Phokathaba Platinum Mine, is located on the Eastern Limb of the Bushveld Complex in the Limpopo Province of South Africa (Figure 1) on the farm Maandagshoek 254 KT within the Fetakgomo-Greater Tubatse Local Municipality (FGTLM). The mine has approximately 6 km of mapped UG2 Platinum Group Metals (PGM) reef outcropping around the margin of two primary hills.

The mining activities are authorized in terms of the Mineral and Petroleum Resources Development Act (No 28 of 2002) (MPRDA). The EMPR (AGES AG-R-07-03-07) was approved by the DMR on 2007/11/13, and infrastructure establishment subsequently commenced and the mine produced its first concentrate for shipment in March 2009. The mine then went into care and maintenance in August 2012 and no mining or processing activities took place until it was reopened in January 2015. However, continuing adverse local and global economic and market circumstances led to the mine being placed in care and maintenance again at end March 2016.

Phokathaba Platinum (Pty) Ltd has an Integrated Water Use Licence (IWUL) (Licence No. 04/B71E/ABCGIJ/1510; File No. 16/2/7/B700/C126) that was issued on 2 March 2012.

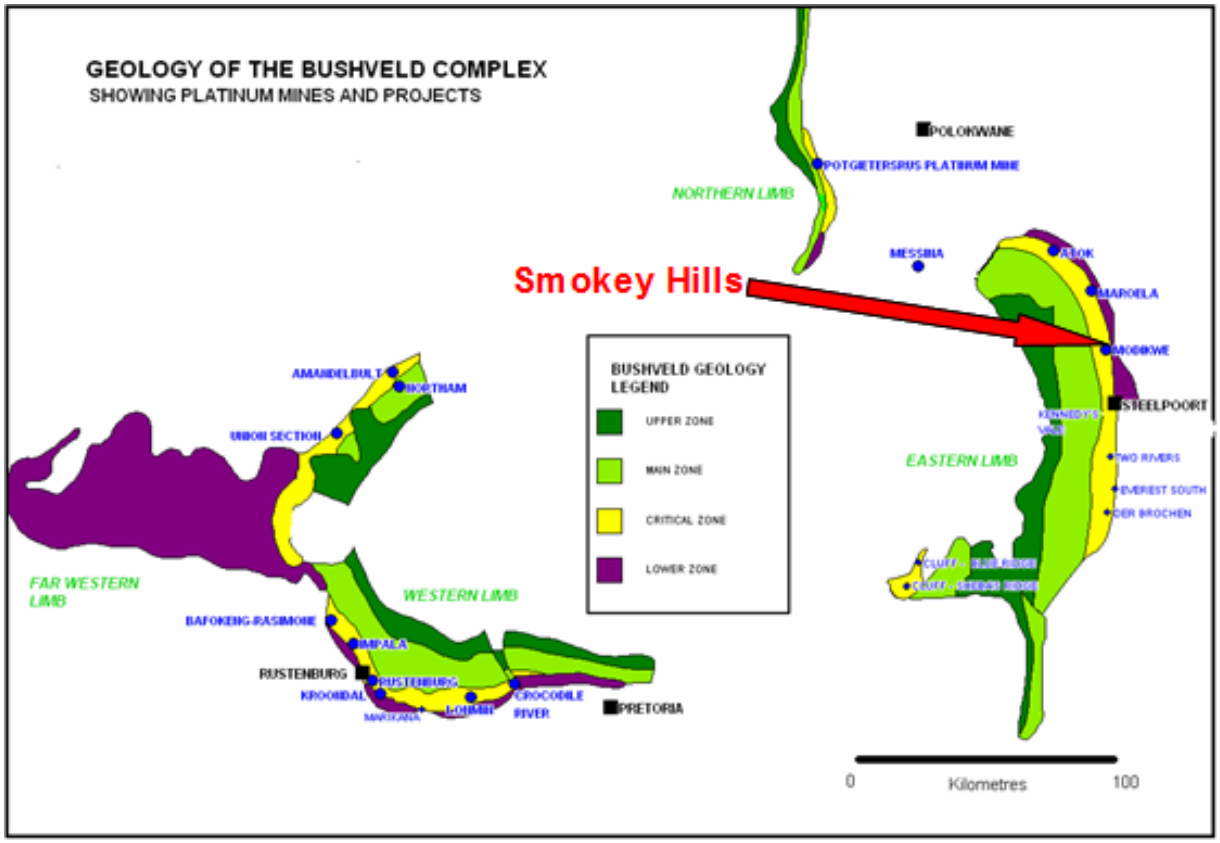

Figure 1: Location of the Smokey Hills mine on the Eastern Limb of the Bushveld Complex

5.2. Existing Mining Operations

5.2.1. Mineral and surface rights

Phokathaba Platinum (Pty) Ltd holds mineral rights over the property for the mining of Platinum Group Metals (PGM). The surface rights of the farm Maandagshoek 254 KT are held by the National Government of the Republic of South Africa.

5.2.2. Description of the Activity

Current mine infrastructure consists of historical opencast operations and underground operations around two Hills (Hill 2 & 3). Mining originally started as opencast operations whereafter the opencast areas were used to gain access to underground; with 3 Adits at each hill spaced on dip.

5.2.3. Existing Mining Infrastructure

The infrastructure for an operating mine is in place and includes:

- Access and haul roads,
- Access control along access road;
- Pipe bridge crossing;
- Historical opencast operation around Hill 2 and 3;
- Underground operations with 6 adits comprising around Hill 2 and 3;

- Office buildings;
- Eskom electricity power supply;
- Water supply from the Lebalelo Water User Association via the Mooihoek Dam; which includes a pipeline, two diesel driven transfer pumps, diesel generator, 1000 litre diesel tank and water reservoir (6000 m^3 capacity);
- Processing plant and related infrastructure (including associated process water dam and run of mine stockpile);
- A tailings storage facility, return water sump, pollution control dam and pump station;
- The mining contractors facilities and associated infrastructure;
- Various surface water management structures including dams, runoff control works and stream diversions;
- Potable water tanks, raw water tank, fire water tank and sewage treatment facility;
- Overburden dumps;
- Workshop, diesel and oil storage facilities and wash bays.

Open pit mining was carried out when the mine first started operating. The mine extracted and processed +/- 417 500 tons of UG2 ore from this initial open pit mining, and thus has the benefit of experience in the open pit mining of this deposit.

The mining lease area is 1135 hectares, however the surface footprint only extents 56 hectares and is being used for infrastructure, roads, servitudes etc. Refer to Figure 2 and Figure 3 for photos of the existing mining facilities and Figure 4 for a layout of the mine.

The mine site is fully fenced and the fence is inspected regularly by security personnel. Access control is strictly enforced. Individual areas (such as the plant area, offices, laboratory, maintenance yard etc.) are fenced separately.

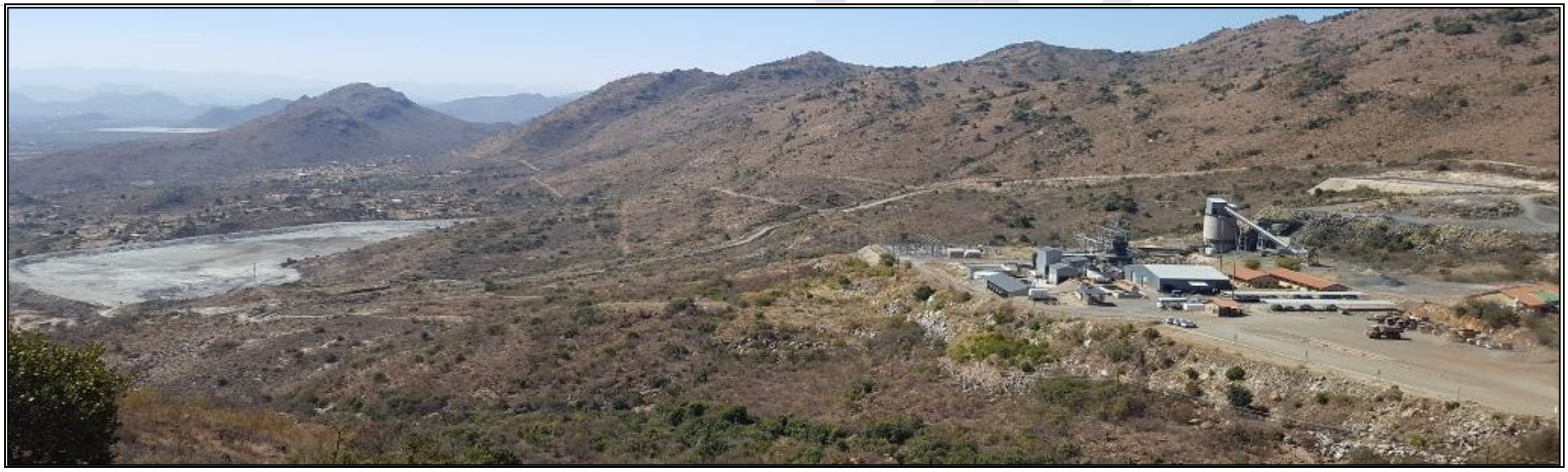

Figure 2: **View of the Smokey Hills Mine plant, offices and tailings dam looking north. The plant and offices are visible to the right and the tailings dam on the left.**

Figure 3: **View of the opencast and underground mining area between Hills 2 and Hill 3 looking south-west.**

5.2.3.1. Processing Plant

A processing plant is located at the mine and commenced production in March 2009. The plant consists of a typical UG2 processing plant with a mill-float-mill-float (or "MF2") configuration with a capacity of 60 000 tonnes/month. The concentrate has a typical grade of 200 g per ton. The concentrate produced is trucked to Rustenburg for smelting and refinement.

The plant consists of the following circuits:

- Jaw crushing;
- Cone crushing in closed circuit with a screen;
- Primary ball mill in closed circuit with a screen;
- Primary flotation;
- Secondary ball mill in closed circuit with a cyclone;
- Secondary flotation;
- Chrome spirals recovery circuit;
- PGM concentrate and tails thickening;
- PGM concentrate filtering and storage;
- Reagent make-up and dosing circuits; and
- Water recycling and storage (process water dam)

The crushing circuit consists of a primary crushing with secondary crushing in closed circuit with a screen. A storage silo is situated between the crushing and milling plants.

The milling section consists of primary and secondary milling; the mills are identical 1.5 MW units. Primary mill discharge proceeds to rougher flotation and the concentrate from rougher flotation is cleaned before reporting to final concentrate.

Tailings from the cleaner and scavenger flotation sections report to the secondary mill. The secondary mill discharge reports to the secondary rougher flotation, the float tails are sent to final tailings and the concentrate to the cleaner flotation and thence to final concentrate.

The final concentrate is filtered using a Larox filter and stored before being loaded and transported to the refinery.

The open pit ore mined contains both oxidized and fresh material with varying metallurgical recoveries. Batch treatment of the ore types is required to be done separately to optimize metal recovery, and also to avoid adverse impact on the ore mined from underground mining that is also taking place.

The process plant residue is pumped to an existing established Tailings Storage Facility (TSF / Tailings Dam).

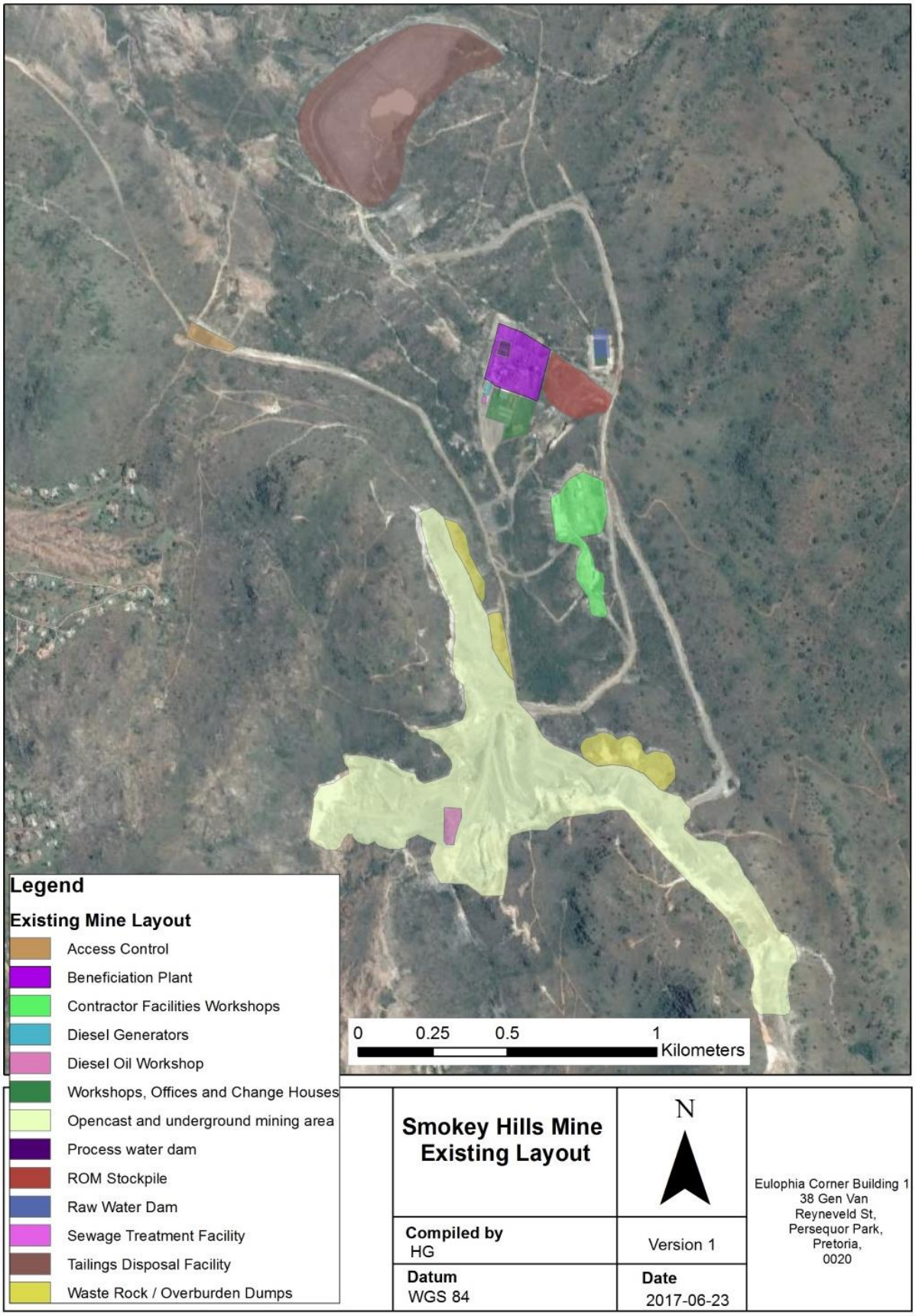

Figure 4: Layout map of Smokey Hills Mine showing existing infrastructure.

A further description of existing mine areas and infrastructure on the Smokey Hills mine property include:

5.2.3.2. Open pit and underground mining areas

The project developed initially as an open cut operation. The shallow open pits provided waste rock for the development of the tailings impoundment, roads and civil works on the mine site. The open pits provided ore for approximately nine months. The underground mine operation commenced towards the end of 2008. The mine area comprises of six adits developed in the side of the hills on the mine site which provide access to the UG2.

5.2.3.3. Tailings Facility

The tailings impoundment has a footprint of approximately 24 ha. The tailings facility has been designed to return water directly to the process plant.

A number of changes to the layout and designs included in the approved EMPR (AGES, 2007) took place when construction of the mine commenced in 2008; most of which relate to the tailings dam design and return water dam (RWD) that was included in the 2007 EMPR.

According to the tailings dam design report by Fraser Alexander (Appendix 9), the final design comprises a side-hill facility initiating as a 2nd generation impoundment converting to a 4th generation upstream cyclone dam with a floating pumped decant system.

The final design comprises a waste rock starter wall to an elevation of 1035masl. Construction of the TDF commenced in April 2008. The footprint beneath the wall was first cleared of vegetation and soft soil. A key trench was excavated through soft material to hard rock along the centreline of the starter wall.

The key trench was backfilled with waste rock. The waste rock wall was developed in two sequential phases, first to approximately 1025masl to allow tailings deposition to commence while the wall was raised to 1035masl. The downstream slope comprises two lifts at angle of repose slopes (1:1,5) separated by a 10m wide bench at 1025m to flatten the overall slope angle. The upstream slope commenced with a 2 to 3m high compacted earth heel wall and a then the waste rock slope at around 1:3 slope to 1025masl.

The rock slope was dressed with a compacted soil layer and covered with a 1.5mm HDPE liner. The purpose of the HDPE liner, specified by SRK in the feasibility design, is to reduce seepage through the waste rock wall (Figure 5).

Figure 5: Construction taking place on the TDF showing the compacted soil layer beneath 1.5mm HDPE liner

An 8m wide bench was formed on the upstream side at 1025m where after the waste rock wall was raised at 1:1.5 to 1035masl. The crest width at this elevation is 10m.

A filter drain, comprising graded sand overlying A4 Bidim wrapped stone encapsulating perforated 165mm Cordrain collection pipes was constructed on top of the heel wall. The purpose of this heel drain is to reduce the pore pressure exerted on the HDPE liner and so reduce the seepage potential through the wall.

An elevated filter drain is constructed on the upstream bench at 1025masl (and higher on natural ground as the flanks of the dam extend up the side of the mountain). The purpose of this drain is to capture seepage flowing through the cyclone underflow wall developed on top of the filter drain. This filter drain prevents the phreatic surface from rising and reduces the seepage through the rock wall above the liner and is thus the key element of the design of the wall.

Both the filter drains discharge into a sump buried into the heel wall at the lowest point in the basin of the dam. An extractable borehole pump lowered into the sump extracts the filter drain discharge, depositing this back into the basin of the dam where most of it will become available for re-circulation to the process plant (process water dam at the plant).

The upstream cyclone wall development method creates substantial freeboard on the dam so storms can be readily accommodated in the basin. This in turn allows return water to be pumped directly from the basin of the tailings dam back to the process plant rather than first decanting the supernatant water through a fixed gravity penstock to downstream off dam water containment facilities (return water dam) from whence the water then has to be pumped back to the process plant. The lesser pumping head reduces the operating cost over the life of

the operation and the cost of the off dam water storage facilities, including the land sterilization, are avoided.

Although water entering the TDF basin would be pumped back to the process plant, large storms could lead to an excess of water temporarily accumulating in the basin. In order to manage the risk associated with this scenario, an emergency decant gravity penstock has been incorporated into the design. This penstock comprises two concrete penstock ring towers that will be incrementally raised as the basin level rises, feeding into a single steel outfall pipe passing through the wall. This penstock would only discharge in the event of a flood so the water will not be recovered but flow downstream to the environment.

The changes to the layout approved in the original EMPR (concept design) compared to what was constructed once the detail design was performed are indicated below:

ASPECT	**CONCEPT / FEASIBILITY DESIGN** (AS PER 2007 EMPR)	**DETAIL DESIGN** (CONSTRUCTED)
Footprint		
• Location	Same	Same
• Size (Area)	Includes RWD	No RWD
Starter Wall		
• Material	Max 200mm compacted waste rock	ROM Waste rock
• Slopes	1:3 upstream 1:2 downstream straight	1:2.5 upstream 1:1,5 benched to 1:2
• Liner	1.5mm HDPE	Same
• Drainage	Upstream toe filter drain	Same
Tailings dam wall		
• Method	Centreline (practically flawed)	Upstream
• Material	200mm compacted rock	Tailings Underflow
Catchment Paddocks	Downstream of toe	On Benches
Decant System	Fixed gravity penstock	Floating Pumps
Return and Storm water		
• System	Off- dam storage	On dam storage
• Return system	Pumped	None (see decant)
Upstream cut-off	Theoretical Isolation	Partial isolation

5.2.3.4. Raw water dam

The raw water dam (6 000 m³) serves to store water piped from the Mooihoek dam.

5.2.4. Additional Proposed Infrastructure

5.2.4.1. Opencast development (removed from scope)

The original scope of work for this environmental authorisation process included the re-starting of short-term open pit mining (+/- 1 year) concurrently with the current underground mining at Hills 2 and 3. Three open pits were proposed; two on Hill 2 and one open pit on Hill 3.

Phokathaba has however made the decision to not go ahead with the open pit development and instead the only future infrastructure requiring authorisation relate to the stormwater management infrastructure detailed in the section below.

5.2.4.2. Stormwater Management Infrastructure

In the approved EMPR for the mine (AGES, 2007) the dirty water runoff from the treatment plant and ore stockpiles was proposed to be collected and stored in a pollution control dam with a capacity of 15 000 m^3. Dirty water runoff from the mining contractor's camp and the temporary waste rock dump was proposed to be collected in a sump with a capacity of approximately 3400 m^3, from where it was proposed to be pumped to the treatment process. The tailings dam design was however modified by Fraser Alexander (refer to Section 5.2.3.3 above) and the pond on top of the TDF was up to date used to contain dirty stormwater from the plant and offices area.

The storm water management plan (SWMP) for the mine was recently updated by V&V Consulting Engineers in order to ensure that stormwater is adequately managed on site (V&V Consulting Engineers, 2016). The SWMP was originally compiled in 2016 to manage stormwater for the existing facilities as well as the proposed open pits. A total of 6 or 7 PCD's would have been required if the proposed opencast extension project had gone ahead. The SWMP compiled by V&V for all these facilities is attached as Appendix 9.2 of this report. In June 2017 V&V Consulting Engineers (now named EOH Industrial Technologies) compiled a cover letter to the original report as well as an updated plan showing the Pollution Control Dams that is now proposed with the opencast extensions not part of the scope anymore. Without the proposed open pit expansions two Pollution Control Dams (PCD's) and one Evaporation dam (serving as a PCD) are proposed as indicated in Table 3 and Figure 6.

Table 3: PCD's and Evaporation Dam Proposed

Name	Required Size (m^3)	Notes
PCD1	50 000 m3	PCD required to collect dirty storm water from the underground and historical opencast mining areas.
PCD2	25 000 m3	PCD required to collect dirty storm water from the plant, ROM stockpile, workshops and associated facilities.
Evaporation Dam (PCD)	Not specified. Sealing of bottom existing open pit (refer to Notes).	Water naturally collects in the existing open cast pit on Hill 2. No formal structure will be built, but the lowest part of the pit will be sealed in order to prevent water ingress into the groundwater system. Water will naturally evaporate from this dam.

Two alternatives were originally considered for collecting stormwater from the plant and adjacent areas:

5. Existing Tailings Dam pool to be used for storm water containment
6. Separate Pollution Control Dam to be constructed (PCD2 referred to above)

The tailings dam (TDF) designed by Fraser Alexander (Robinson, 2009) commenced as a 2nd generation impoundment and was then converted to a 4th generation upstream cyclone facility. This created substantial freeboard and hence has the capacity to temporarily contain storm water. The water collecting on the tailings dam pool would be pumped to the plant for use in the process, thereby keeping the pool of water small and maintaining the capacity of the TDF to receive stormwater. Up to date stormwater from the plant and surrounding catchment was directed to the TDF.

The Stormwater Management Plan of the mine included in this application and report however provides for a more conventional approach in that a separate Pollution Control Dam (PCD2 referred to above) with a capacity of 25 000 m^3 is proposed to be constructed between the plant and the TDF. The stormwater management plan submitted as part of the approved EMPR for the mine (AGES, 2007), as well as the approved Water Use Licence (WUL) provides for a PCD of 15 000 m^3 in this location. The proposal is therefore to increase the capacity of the dam from 15 000 m^3 to 25 000 m^3.

The dirty water catchments, PCDs, stormwater channels, silt traps and stormwater management around the TDF are indicated in Drawing Number 1759/VV/04SwMp included as part of the Stormwater Management Plan attached as Appendix 9.2.

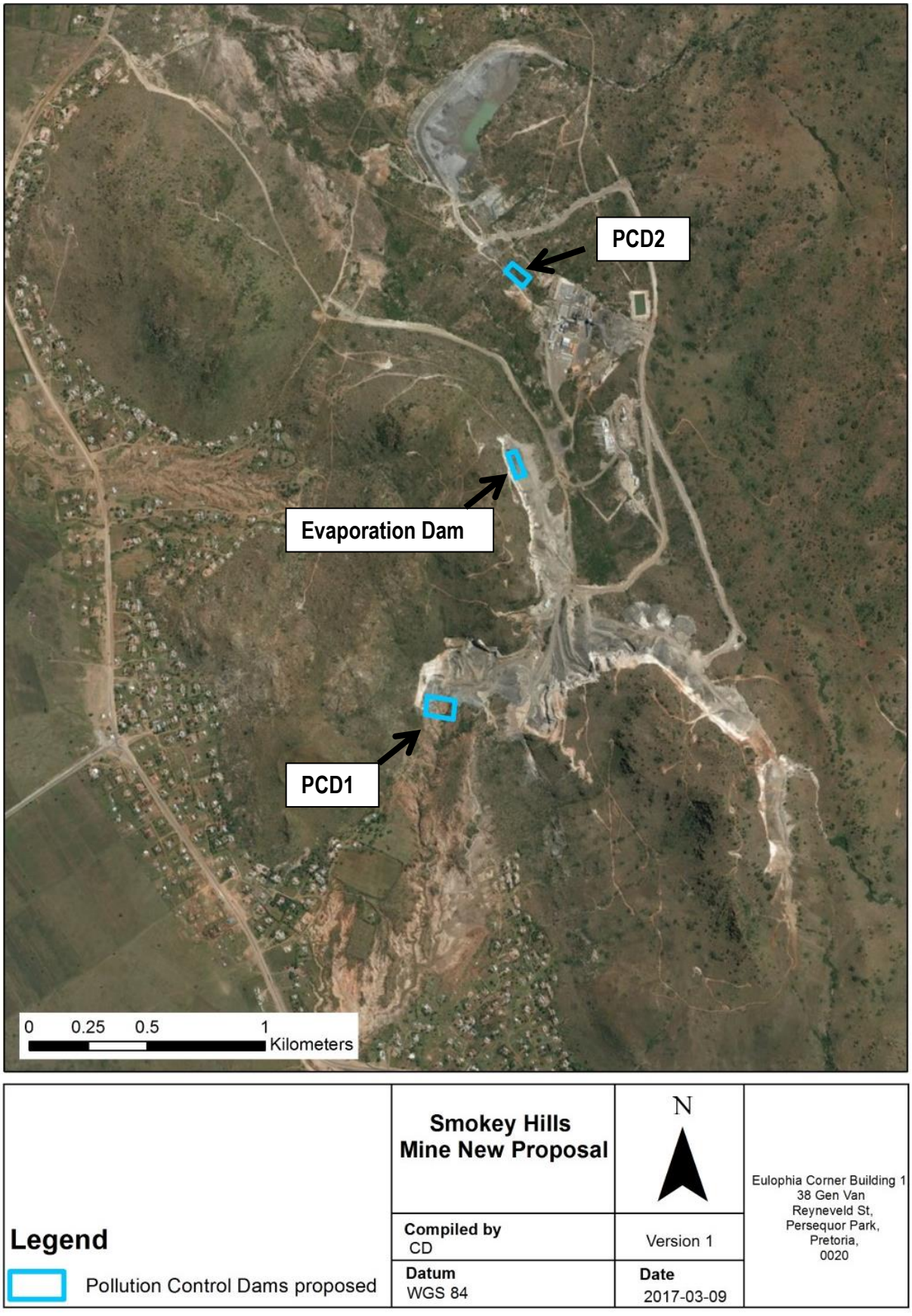

Figure 6: Layout of proposed pollution control dams (including evaporation dam)

6. POLICY AND LEGISLATIVE CONTEXT

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT (a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process);	**REFERENCE WHERE APPLIED**
Legislation	
The Constitution of the Republic of South Africa (Act 108 of 1996) Section 2 of the Constitution of the Republic of South Africa (Act 108 of 1996) (CA) states that: "This Constitution is the supreme law of the Republic; law or conduct inconsistent with it is invalid, and the obligations imposed by it must be fulfilled." Section 24 of the CA, states that everyone has the right to an environment that is not harmful to their health or well-being and to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that: • prevent pollution and ecological degradation; • promote conservation; and • secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development. Section 24 guarantees the protection of the environment through reasonable legislative (and other measures) and such legislation is continuously in the process of being promulgated. Section 33(1) concerns administrative justice which includes the constitutional right to administrative action that is lawful, reasonable and procedurally fair.	The Draft EIA&EMPR Report was accordingly prepared, submitted and considered within the constitutional framework set by inter alia section 24 and 33 of the Constitution.
The National Environmental Management Act (107 of 1998) and the Environmental Impact Assessment Regulations, 2014 (as amended) The overarching principle of the National Environmental Management Act 1998 (Act 107 of 1998) (NEMA) is sustainable development. It defines sustainability as meaning the integration of social, economic and environmental factors into planning, implementation and decision making so as to ensure the development	An application for Environmental Authorisation in line with the provisions contained in **GNR 982 (EIA Regulations 2014)** was submitted to the Department of Mineral Resources: Limpopo Region (DMR), in terms of section 24 of the NEMA for consideration. The activities specified above in Table 2 were identified as being

serves present and future generations. Section 2 of NEMA (Act no 107 of 1989) provides for National Environmental Management Principles. These principles include: • Environmental management must place people and their needs at the forefront of its concern. • Development must be socially, environmentally and economically sustainable. • Environmental management must be integrated, acknowledging that all elements of the environment are linked and interrelated. • Environmental justice must be pursued. • Equitable access to environmental resources, benefits and services to meet basic human needs and ensure human wellbeing must be pursued. • Responsibility for the environmental health and safety consequences of a policy, programme, project, product, process, service or activity exists throughout its life cycle. • The participation of all Interested and Affected Parties (I&APs) in environmental governance must be promoted. • Decisions must take into account the interests, needs and values of all I&APs. • The social, economic and environmental impacts of activities, including disadvantages and benefits, must be considered, assessed and evaluated, and decisions must be appropriate in the light of such consideration and assessment. • Decisions must be taken in an open and transparent manner, and access to information must be provided in accordance with the law. • The environment is held in public trust for the people, the beneficial use of environmental resources must serve the public interest and the environment must be protected as the people's common heritage. • The costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment. The Environmental Impact Assessment (EIA) process to be undertaken in respect of the authorization	applicable to the proposed mining operations. The Draft Scoping Report was distributed for public review for a period of 30 days as part of the environmental impact assessment process. The Smokey Hills Platinum Opencast Extension Project: Draft EIA&EMPR will also be subject to a 30 day public review period.

process of the proposed mining operations is in compliance with the MPRDA, as well as the NEMA read with the Environmental Impact Assessment Regulations of 2014 (as amended). The proposed development involves 'listed activities', as identified in terms of the NEMA and in terms of section 24(1), the potential consequences for or impacts on the environment of inter alia listed activities must be considered, investigated, assessed and reported on to the Minster of Mineral Resources or to the relevant office of the Department responsible for mineral resources, except in respect of those activities that may commence without having to obtain an environmental authorisation in terms of the NEMA.	
GNR 1147 (20 November 2015) of the National Environmental Management Act, 1988 (Act No. 107 of 1998) - Financial Provisioning Regulations In accordance with the above legislation, the holder of a mining right must make the prescribed financial provision for the costs associated with the undertaking of the management, rehabilitation and remediation of the negative environmental impacts due to prospecting, exploration and mining activities and the latent or residual environmental impacts that may become known in future.	The Final Rehabilitation, Decommissioning and Mine Closure Plan was compiled in accordance with GNR 1147 (refer to Appendix 7.6: Rehabilitation, Decommissioning and Mine Closure Plan).
Mineral and Petroleum Resources Development Act, 2002 (Act No 28 of 2002) Previously South African mineral rights were owned either by the State or the private sector. This dual ownership system represented an entry barrier to potential new investors. The current Government's objective is for all mineral rights to be vested in the State, with due regard to constitutional ownership rights and security of tenure. The MPRDA was passed in order to make provision for equitable access to and sustainable development of the nation's mineral and petroleum resources, and to provide for matters connected therewith. The Preamble to the MPRDA inter alia affirms the State's obligation to: • protect the environment for the benefit of present and future generations; • ensure ecologically sustainable development of mineral and petroleum resources; and • promote economic and social development. The aforesaid preamble affirms the general right to an environment provided for in section 24 of the Constitution (as set out hereinabove).	The Mining Right Application was prepared and submitted according to the provisions of this legislation. The legislation will be heeded throughout the proposed mining operations and will be considered in the compilation of the EMPr.

The objects of the MPRDA, as set out in section 2 thereof serve as a guide to the interpretation of the Act. The objects of the MPRDA are as follows: • recognise the internationally accepted right of the State to exercise sovereignty over all the mineral and petroleum resources within the Republic; • give effect to the principle of the State's custodianship of the nation's mineral and petroleum resources; • promote equitable access to the nation's mineral and petroleum resources to all the people of South Africa; • substantially and meaningfully expand opportunities for historically disadvantaged persons, including women, to enter the mineral and petroleum industries and to benefit from the exploitation of the nation's mineral and petroleum resources; • promote economic growth and mineral and petroleum resources development in the Republic; • promote employment and advance the social and economic welfare of all South Africans; • provide for security of tenure in respect of prospecting, exploration, mining and production operations; • give effect to section 24 of the Constitution by ensuring that the nation's mineral and petroleum resources are developed in an orderly and ecologically sustainable manner while promoting justifiable social and economic development; and • ensure that holders of mining and production rights contribute towards the socio-economic development of the areas in which they are operating. The national environmental management principles provided for in section 2 of the NEMA apply to all prospecting and mining operations and any matter relating to such operation. These principles apply throughout the Republic to the actions of all organs of state including inter alia the Department of Mineral Resources that may significantly affect the environment. Any prospecting or mining operation must be conducted in accordance with generally accepted principles of sustainable development by integrating social, economic and environmental factors into the planning and implementation of prospecting and mining projects in order to ensure that exploitation of mineral resources	

serves present and future generations. Section 38 of the MPRDA states that the holder of inter alia, a prospecting right, mining right or mining permit: • Must at all times give effect to the general objectives of integrated environmental management laid down in Chapter 5 of NEMA; • Must consider, investigate, assess and communicate the impact of his or her prospecting or mining on the environment as contemplated in section 24(7) of NEMA; • Must manage all environmental impacts – - In accordance with an environmental management plan or approved environmental management programme, where appropriate, and - As an integral part of the prospecting or mining operations, unless the Minister directs otherwise. • Must as far as reasonably practicable, rehabilitate the environment affected by the prospecting or mining operations to its natural or predetermined state or to a land use which conforms to the generally accepted principle of sustainable development; and • Is responsible for any environmental damage, pollution or ecological degradation as a result of prospecting or mining operations and which may occur inside and outside the boundaries of the area to which such right, permit or permission relates.	
National Water Act (Act No 36 of 1998) [NWA] In terms of the NWA, the national government, acting through the Minister of Water and Environmental Affairs (previously the Minister of Water Affairs and Forestry), is the public trustee of South Africa's water resources, and must ensure that water is protected, used, development, conserved, managed and controlled in a sustainable and equitable manner for the benefit of all persons (section 3(1)). In terms of the NWA a person may only use water without a license under certain circumstances. All other use, provided that such use qualify as a use listed in section 21 of the Act, require a water use license. A person may only use water without a license if such water use is permissible under Schedule 1 (generally	An IWULA for the mining development will be submitted to the Department of Water and Sanitation (DWS) during the EIA Phase. A Pre-Application Meeting was held with the DWS during the draft Scoping Report review period. The requirements of regulation GN704 will be adhered to. All clean and dirty water management structures will be designed in accordance with section 6 of the GN704.

domestic type use) if that water use constitutes a continuation of an existing lawful water use (water uses being undertaken prior to the commencement of the NWA, generally in terms of the Water Act of 1956), or if that water use is permissible in terms of a general authorisation issued under section 39 (general authorisations allow for the use of certain section 21 uses provided that the criteria and thresholds described in the general authorisation is met). Permissible water use furthermore includes water use authorised by a license issued in terms of the NWA.

Section 21 of the NWA indicates that "water use" includes:

- taking water from a water resource (section 21(a));
- storing water (section 21(b));
- impeding or diverting the flow of water in a water course (section 21(c));
- engaging in a stream flow reduction activity contemplated in section 36 (section 21(d));
- engaging in a controlled activity which has either been declared as such or is identified in section 37(1) (section 21(e));
- discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit (section 21(f));
- disposing of waste in a manner which may detrimentally impact on a water resource (section 21(g);
- disposing in any manner of water which contains waste from, or which has heated in, any industrial or power generation process (section 21 (h));
- altering the bed, banks, course or characteristics of a water course (section 21(i));
- removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people (section 21(j)); and
- using water for recreational purposes (section 21(k)).

In addition to the above and in terms of section 26 of the NWA, Regulations on the Use of Water for Mining and Related Activities Aimed at the Protection of Water Resources were published in GN R. 704 of 4 June 1999 (GN R. 704). The aforesaid GN R. 704 provides for inter alia the capacity requirements of clean and dirty water systems (regulation 6), the protection of water resources by a person in control of a mine

(regulation 7), security and addition measures (regulation 8) and temporary or permanent cessation of a mine or activity (regulation 9). According to GN R. 704 “no person in charge of a mine may carry on any underground or opencast mining, prospecting or any other operation or activity under or within the 1:50 year flood-line or within a horizontal distance of 100 metres from any watercourse or estuary, whichever is the greatest”. Insofar as the undertaking of section 21 water uses is concerned, it is anticipated that application for registration and water use licensing will be undertaken. Of particular relevance within the context of waste disposal and water use and management the applicable water uses will be identified and included in the EIA&EMPR.	
National Heritage Resources Act (Act 25 of 1999) (NHRA) The NHRA established the South African Heritage Resources Agency (SAHRA) as well as provincial heritage resources agencies. In terms of the NHRA, no person may destroy, damage, deface, excavate, alter, remove from its original position, subdivide or change the planning status of any heritage site without a permit issued by the heritage resources authority responsible for the protection of such site. No person may damage, disfigure, alter, subdivide or in any other way develop any part of a protected area unless, at least 60 days prior to the initiation of such changes, he/she/it has consulted with the relevant heritage resources authority. Section 34 of the NHRA provides for the protection of immovable property by providing for a prohibition on altering or demolishing any structure or part of any structure, which is older than 60 years, without a permit issued by the relevant provincial heritage resources authority. Accordingly, should the proposed activities, prospecting or mining activities or the closure and rehabilitation of mined land involve the altering or demolishing of any structure or part of any structure, which is older than 60 years, a permit issued by the relevant provincial heritage resources authority is required. No person may, without a permit issued by the responsible heritage resources authority destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite; destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite; trade in, sell for private gain, export or attempt to export from the Republic any category of archaeological or palaeontological material or object, or any meteorite; or bring onto or use at an archaeological or palaeontological site any excavation equipment or	An Archaeological Impact Assessment has been conducted for the project.

any equipment which assist in the detection or recovery of metals or archaeological and palaeontological material or objects, or use such equipment for the recovery of meteorites. No person may, without a permit issued by SAHRA or a provincial heritage resources authority destroy, damage, alter, exhume or remove from its original position or otherwise disturb the grave of a victim of conflict, or any burial ground or part thereof which contains such graves; destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority; or bring onto or use at the burial ground or grave referred to above any excavation equipment or any equipment which assists in the detection or recovery of metals. Section 38 of the NHRA states that any person who intends to undertake developments categorised in Section 38 of the NHRA must at the very earliest stages of initiating such development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development. By way of example, the developments referred to in Section 38 of the NHRA include: • the construction of a road, wall, power-line, pipeline, canal or other similar form of linear development or barrier exceeding 300 metres in length; • the construction of a bridge or similar structure exceeding 50 metres in length; • any development or other activity which will change the character of a site as specified in the regulations; • any other category of development provided for in regulations by SAHRA or the provincial heritage resources authority. However, the abovementioned provisions are subject to the exclusion that section 38 does not apply to a development as described in subsection (1) if an evaluation of the impact of such development on heritage resources is required in terms of the Environment Conservation Act 73 of 1989 (now presumably the NEMA in view of the repeal of the listed activities under the ECA): Provided that the consenting authority must ensure that the evaluation fulfils the requirements of the relevant heritage resources authority in terms of	

subsection (3), and any comments and recommendations of the relevant heritage resources authority with regard to such development have been taken into account prior to the granting of the consent.	
National Environmental Management: Biodiversity Act (Act 10 of 2004) The National Environmental Management Biodiversity Act (Act No. 10 of 2004) (NEMBA) aims to provide for the management and conservation of South Africa's biodiversity within the framework of the National Environmental Management Act, 1998; the protection of species and ecosystems that warrant national protection; the sustainable use of indigenous biological resources; the fair and equitable sharing of benefits arising from bioprospecting involving indigenous biological resources; the establishment and functions of a South African National Biodiversity Institute; and for matters connected therewith. The NEMBA provides for the publishing of various lists of species and ecosystems by the Minister of Environmental Affairs and Tourism (now the Minister of Water and Environmental Affairs) as well as by a Member of the Executive Council responsible for the conservation of biodiversity of a province in relation to which certain activities may not be undertaken without a permit. In terms of Section 57 of the NEMBA, no person may carry out any restricted activity involving any species which has been identified by the Minister as "critically endangered species", "endangered species", "vulnerable species" or "protected species" without a permit. The NEMBA defines "restricted activity" in relation to such identified species so as to include, but not limited to, "hunting, catching, capturing, killing, gathering, collecting, plucking, picking parts of, cutting, chopping off, uprooting, damaging, destroying, having in possession, exercising physical control over, moving or translocating". The Minister has made regulations in terms of section 97 of the NEMBA with regards to Threatened and Protected Species which came into effect on 1 June 2007. Furthermore, the Minister published lists of critically endangered, endangered, vulnerable and protected species in terms of section 56(1) of the NEMBA.	The legislation will be heeded throughout the proposed mining operations and will be considered in the Ecological Impact Assessment.
National Forests Act (Act 84 of 1998) The project may involve the cutting, disturbing, damaging or destroying of any protected trees declared in terms of section 12 of the National Forest Act (NFA) (Act 84 of 1998). Should the presence of these trees on site be confirmed after receipt of the Record of Decision (ROD), a licence in terms of section 15 of the	It is expected that the project will involve the cutting, disturbing, damaging or destroying of protected trees declared in terms of section 12 of the NFA, therefore a licence in terms of section 15 of the NFA might be required. However the presence of protected trees

NFA will be required.	must be verified in order to confirm their presence. The EMPR will make reference to the applicability of this aspect.
National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) (NEMAQA) The National Environmental Management Air Quality Act (Act 39 of 2004) (NEMAQA) came into power on the 24th of February 2005. Additionally the amendment to the Minimum Emission Standards (GN R 893) also came into effect on the 12 June 2015. This Notice provides a list of activities that may cause atmospheric emissions which have or may have a significant detrimental effect on the environment as well as the minimum emission standards ("MES") for these activities as contemplated in section 21 of NEMAQA. The effect of the commencement of the NEMAQA and the listed activities, listed in GN 964 is that an atmospheric emission licence (AEL) is now required for conducting these listed activities.	Currently there are no listed activities that require registration/permitting according to National Environmental Management: Air Quality Act, 2003 (Act No. 39 of 2004) for the proposed mine.
National Environmental Management: Waste Act (Act 59 of 2008) ("NEMWA") The NEMWA commenced on 1 July 2009 and as a result of its commencement the relevant provisions in the Environment Conservation Act 73 of 1989 (ECA) in respect of waste management, were repealed. The NEMWA sets out to reform the law regulating waste management and deals with waste management and control more comprehensively than was dealt with in the ECA. It also introduces new and distinct concepts never before canvassed within the realm of waste management in South Africa, such as the concept of contaminated land and extended producer responsibility. It also provides for more elaborate definitions to assist in the interpretation of the Act. Section 19 of the NEMWA provides for listed waste management activities and states in terms of section 19(1), the Minister may publish a list of waste management activities that have, or are likely to have a detrimental effect on the environment. Such a list was published in GNR 921 of 29 November 2013. In accordance with section 19(3), the Schedule to GNR 921 provides that a waste management licence is required for those activities listed therein prior to the commencement, undertaking or conducting of same. In addition, GNR921 differentiates between Category A, B, and Category C waste management activities. Category A waste management activities are those which require the conducting of a basic assessment process as stipulated in the EIA Regulations, 2014 promulgated in terms of the NEMA as part of the waste management licence application and Category B waste management activities are those that require the conducting of a scoping and environmental impact assessment process stipulated in the EIA Regulations, 2014 as part of the waste management licence application. Category C waste management activities do	The scope of the original application included various opencast pits as well as associated overburden dumps. The proposed overburden dumps would have required a waste management licence (WML) as listed in GNR 921 of 29 November 2013, however since the opencast pits and overburden dumps were removed from the proposal a WML is not required for the proposed project anymore.

not require a waste management licence, however a person who wished to commence, undertake or conduct a waste management activity listed under this category, must comply with the relevant requirements and standards, Section 20 of the NEMWA pertains to the consequences of listing waste management activities and states that no person my commence, undertake or conduct a waste management activity, except in accordance with the requirements or standards for that activity as determined by the Minister or in accordance with a waste management licence issued in respect of that activity, if a licence is required. In terms of the current statutory framework with regards to waste management, a waste management licence is required for those waste management activities identified in the Schedule to GNR 921. Certain of the waste management activities listed in the Schedule are governed by specific thresholds. Where any process or activity falls below or outside the thresholds stipulated, a waste management licence is not required.	
Integrated Development Plans	
Greater Sekhukhune District Municipality (DM) 2014/15 Final IDP Review: Greater Tubatse Local Municipality (LM) Draft IDP 2015 – 2016 Legislation was enacted to guide the establishment of and functions of metropolitan, district and local municipalities, including the promulgation of integrated development planning as a tool for development in district and local municipal IDP reports. Section 25 of the Municipal System Act requires that an IDP must be compatible with national and provincial development plans and planning requirements. The above municipalities are characterised by similar developmental constraints highlighted in the Integrated Development Plans for the respective districts: • Large portions of the population reside in rural areas with limited access to opportunities for social and economic upliftment; • Due to its rural nature; the Tubatse Municipality is confronted with a high service delivery backlogs. Majority of the settlements are far apart which; makes the provision and maintenance of services very costly. Some of these areas are too small to attain the economic threshold required to provide social facilities in a cost-effective manner. • There are extensive skills shortages in the areas and limited provision of human resource	The proposed development falls under the jurisdiction of the Fetakgomo-Greater Tubatse Local Municipality which is located in the Greater Sekhukhune District Municipality. The need & desirability of the project is in line with the IDP's of these municipalities.

development programmes that would address the skills gap, specifically in the mining sector that is an important revenue generator for both local municipalities; • Existence of large infrastructure backlogs. Together with the identified agriculture and tourism potential, mining is delineated as a priority sector for both municipalities. District municipalities endorse and promote communication and partnerships in the mining industry. It is widely recognised that investment within the mining industry is paramount for the creation of social and economic upliftment within the municipalities.	

7. 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).

7.1. Need

The Bushveld Igneous Complex, which extends for 400 kilometres in the Limpopo Province, contains the world's largest known deposits of platinum group metals (PGMs) - platinum, palladium, rhodium, ruthenium, iridium and osmium. The Bushveld Igneous Complex consists of the Merensky and UG2 Reefs as well as the Platreef in the northern extension. The Merensky Reef accounts for over 80% of the platinum mined in South Africa, with the highest PGM values being associated with the UG2 Reef which lies about 200 m to 300 m below the Merensky Reef.

The extraordinary physical properties of the platinum group make its metals almost indispensable in a wide range of industrial applications. Auto catalysts, which account for more than 40% of the total demand for platinum, are the major demand sector for PGMs. Around 38% of the world's platinum finds its way into jewellery, and the electrical and electronics industry accounts for 50% of the annual palladium and ruthenium demands. Growth is associated with PGMs playing a role in fighting viral, bacterial and parasitic infections in the future and even being used as diagnostic tools. The use of clean and efficient fuel cells in the future, in which platinum catalysts are used to convert the chemical energy of a fuel into electrical energy, has for some time been sees as the next new major demand sector for platinum (Chamber of Mines, 2008).

An expected increase in the demand for platinum and palladium is expected for the future due to stricter emissions legislation globally and a rise in the growth of vehicle production and sales. In addition, with global energy demand expected to grow by more than 60% by 2030, the security of energy supply has become a concern and has led to the diversification of energy sources. This has created new opportunities for PGMs in the development of fuel cell technology, which could lead to significant socio-economic development as it will result in job creation in terms of manufacturing, installation and maintenance, as well as skills development (Mining Weekly, 2012).

The benefits of the development of the Phokathaba Platinum Mine is apparent from the above, with the expected increase in demand for platinum-group metals (PGMs) on a global basis, especially for fuel cell technology, which not only provides an alternative clean and sustainable energy source but comes with a variety of socio-economic benefits. In addition to the global socio-economic benefits, the Phokathaba Platinum Mine will also provide the local communities with various benefits relating mainly to job creation and skills development. Unemployment in the region is high and mining is seen to hold major possibilities for the area.

Without the implementation of this project, the mentioned benefits would not be realised. The realization of the outcome the Mining Charter (2004), within the context of the MPRDA (2002), would therefore also not be reached and this has potentially significant negative impacts on

national economic growth and social well-being. The Mining Charter's main objectives, which the Phokathaba Platinum Project will assist to reach, are:

- to promote equitable access to South Africa's Mineral Resources for all South Africans;
- to substantially and meaningfully expand opportunities for historically disadvantaged South Africans (HDSAs);
- to utilize the existing skills base for the empowerment of HDSAs (Refer to the Social and Labour Plan (SLP) as part of the Mining Right);
- to expand the skills base of HDSAs to serve the community; (Refer to the SLP conducted according to the MPRDA);
- to promote employment and advance the social and economic welfare of mining communities and areas supplying mining labour; (Refer to the SLP as part of the Mining Right); and
- to promote beneficiation of South Africa's mineral commodities beyond mining and processing, including the production of consumer products.

The Department of Water and Sanitation (DWS) requires the mine's to separate clean and dirty storm water under Regulation GN704. On-going consultations with DWS have confirmed the DWS requirements to implement measures for the more effective management of storm water and pollution control at the Smokey Hills Mine. This will improve both the protection of the environment and water resources.

Furthermore, the facilities will also create the opportunity for the control of contaminated storm water. The separation of clean and dirty water at the Smokey Hills Mine will prevent contact water from discharging into the environment and the downstream water resources.

7.2. Desirability

Limpopo has rich mineral resources, making mining a critical sector of the economy of the province, contributing 22% to its GDP. Unemployment in the region is high with an estimated 42% of the economically active population in the Fetakgomo-Greater Tubatse Local Municipality being unemployed.

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

Fetakgomo-Greater Tubatse Local Municipality has significant mining and manufacturing (ferrochrome smelters) sectors, but unemployment is still significantly above the provincial average. Information from different sources suggests that the new mining developments that

have already been around could reduce unemployment from 73% (expanded unemployment rate definition) in 2001 to 44% in 2010 and 23% in 2015. Further reduction in the unemployment rate will depend on effective intervention by public sector institutions to facilitate economic sector diversification through competitive cluster value-chain development. This implies upstream development in the manufacturing and trade sector to provide essential items in the mining supply chain by local entrepreneurs. It also implies side-stream development in the form of construction and Urban renewal. This approach is consistent with the Limpopo Employment Growth and Development Plan (Greater Tubatse Draft IDP 2015/2016).

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

The proposed Phokathaba Platinum Mine is currently in care and maintenance therefore the provision of job opportunities and training in the local community will be limited. However, it is evident that currently the need in the local community is significant and this will be reviewed as part of the overall assessment of the community needs. A service provider will be identified to assist with this aspect and a commitment will be made to assisting the service provider to provide effective services to the community from entry level to successful completion of ABET Level 4 (Phokathaba Platinum Mine SLP, 2012).

Phokathaba Platinum Mine is striving to build positive and lasting relationships with the communities of which it forms a part. At this early stage of the project, Phokathaba Platinum Mine has chosen to focus on people development and have placed particular emphasis on improving schools in the communities surrounding the proposed mine. The following projects have been identified as part of the Phokathaba Platinum Mine (SLP, 2012):

- LED Project – Multi-Purpose Community Centre
- LED Project – Morokadieta Classrooms
- LED Project - Ablution Blocks and infrastructure
- LED Project – Brickmaking Project
- LED Project – Access bridge and road to Morokadieta Primary School
- LED Project – Supply of Water at Maandagshoek

8. MOTIVATION FOR THE PREFERRED DEVELOPMENT FOOTPRINT WITHIN THE APPROVED SITE INCLUDING A DESCRIPTION OF THE PROCESS FOLLOWED TO REACH THE PROPOSED PREFERRED 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.

8.1. Process to assess alternatives

The then Department of Environmental Affairs and Tourism (DEAT) guidelines for Integrated Environmental Management (IEM)) procedure requires that an environmental investigation needs to consider feasible alternatives for any proposed development. Therefore, the EIA Regulations require that a number of possible proposals or alternatives for accomplishing the same objectives should be considered.

Various alternatives have been assessed for the project on scoping level and work shopped by means of specialist, client and engineering team interactions.

In the case of the proposed development, possible alternatives were identified through discussions with authorities, discussions with I&AP's (focus group meetings), reviewing of the existing baseline environmental data which was determined prior to initiating the EIA/MRA, specialist inputs/studies and the design team. Alternatives relevant to this development can be categorized into the following:

- **Footprint / Site Alternatives**
  - Location of PCD2
- **Design Alternatives**
  - Stormwater Management
- **The "no-go" alternative**
  - Assessed per environmental aspect/area

8.2. 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.

8.2.1. Footprint / Site Alternatives

8.2.1.1. Location of PCD2

The site initially considered for the placement of Pollution Control Dam 2 (PCD2) was within a small drainage line, since it was the lowest point in the area. Upon recommendation from the project ecologist the PCD was moved to a site approximately 100m away adjacent to the drainage line to a less ecologically sensitive area.

The alternatives were named as followed:

1. PCD2 Alternative 1 (location within drainage line)

2. PCD2 Alternative 2 (located next to drainage line)

Refer to Figure 7 for a map showing the location of these two alternatives.

The largest part of both of the PCD sites constitutes *Searsia keeti – Vitex obovata* shrubveld. This vegetation unit is widespread and was classified by Dr. Buks Henning as being of Moderate ecological sensitivity. PCD2 Alternative 1 was however within a small non-perennial drainage line which is conserved to be of high sensitivity. PCD2 Alternative 2 was placed approximately 100m away from the drainage line within the current stormwater diversion channel transporting water from the plant to the tailings dam. A large part of this footprint area has therefore already been disturbed and therefore has a Low-Medium ecological sensitivity.

The lower ecological sensitivity of the second alternative site for PCD2 therefore ensured that this site was chosen as the preferred location for PCD2.

Figure 7: Alternatives locations assessed for PCD2

8.2.2.Design Alternatives

8.2.2.1. Stormwater Management

The storm water management plan (SWMP) for the mine was updated by V&V Consulting Engineers in order to ensure that stormwater is adequately managed on site (V&V Consulting Engineers, 2016). The SWMP was originally compiled in 2016 to manage stormwater for the existing facilities as well as the proposed open pits. A total of 7 PCD's would have been required if the proposed opencast extension project had gone ahead. The SWMP compiled by V&V for all these facilities is attached as Appendix 9.2 of this report.

Two alternatives were considered to contain contact water from the plant, ROM stockpile and office areas:

1. Existing Tailings Dam pool to be used for storm water containment.
2. Separate Pollution Control Dam to be constructed (PCD2)

The tailings dam design by Fraser Alexander (Robinson, 2009) provided for dirty stormwater from the contractor facilities (including workshop), office and plant area to be collected on top of the tailings dam. PCD2 (as described above) was considered as an alternative.

After consultation with the DWS (pre-application meeting minutes attached to Appendix 8.4) the mine however opted for the more conventional approach in that a separate Pollution Control Dam (PCD2) with a capacity of 25 000 m^3 is proposed to be constructed between the plant and tailings dam. The tailings dam will therefore not be used for stormwater collection anymore. The stormwater management plan submitted as part of the approved EMPR for the mine (AGES, 2007), as well as the approved Water Use Licence (WUL) provides for a PCD of 15 000 m^3 in this location. The proposal is therefore to increase the capacity of the dam from 15 000 m^3 to 25 000 m^3.

In June 2017 V&V Consulting Engineers (now named EOH Industrial Technologies) compiled a cover letter to the original stormwater management report complied for the opencast development as well as an updated plan showing the Pollution Control Dams that is now proposed with the opencast extensions not part of the scope anymore. Without the proposed open pit expansions, two Pollution Control Dams (PCD's) and one Evaporation dam (serving as a PCD) are proposed as indicated in Table 3 and Figure 6.

Table 4: PCD's and Evaporation Dam Proposed

Name	Required Size (m^3)	Notes
PCD1	50 000 m^3	PCD required to collect dirty storm water from the underground and historical opencast mining areas.
PCD2	25 000 m^3	PCD required to collect dirty storm water from the plant, ROM stockpile, workshops and associated facilities.
Evaporation	Not specified.	Water naturally collects in the existing open cast pit on Hill 2.

Dam (PCD)	Sealing of bottom existing open pit (refer to Notes).	No formal structure will be built, but the lowest part of the pit will be sealed in order to prevent water ingress into the groundwater system. Water will naturally evaporate from this dam.

The dirty water catchments, PCDs, stormwater channels, silt traps and stormwater management around the TDF are indicated in Drawing Number 1759/VV/04SwMp included as part of the Stormwater Management Plan attached as Appendix 9.2.

8.2.3. "No-go" Alternative

The assessment of the "no-go" alternative is a legal requirement according to NEMA and the EIA Regulations. In this scenario no development would take place. The environment would be left as is and the impact on the area and potential benefits would remain unchanged.

In the event that the proposed PCD's are not constructed the status quo will be maintained. The purpose of the construction of the PCD's is to allow for the separation of clean and dirty water as required by GN 704. If the PCD's are not developed this will result in negative impacts on water quality as the existing dirty water management infrastructure will not be sufficient to prevent the release of dirty water in the future.

8.2.4. Conclusion

In summary, the following alternatives were considered:

- **Site Alternatives for PCD2:**
  - Alternative 1 - location within drainage line
  - Alternative 2 - located next to drainage line **(preferred)**
- **Design Alternatives for Stormwater Management:**
  - Existing Tailings Dam pool to be used for storm water containment.
  - Separate Pollution Control Dam (PCD2) to be constructed **(preferred)**
- **The "no-go" alternative**
  - If the PCD's are not developed this will result in negative impacts on water quality as the existing dirty water management infrastructure will not be sufficient to prevent the release of dirty water in the future. The No-Go alternative is therefore rejected.

9. 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.

The following process was undertaken to facilitate the public participation process for the proposed project thus far:

9.1. Newspaper Advertisement

An Advertisement, notifying the public of the submission of the Environmental Authorisation Application and the Mining Right Application (MRA) as well as the process to be followed; and requesting I&AP's to register their comments with Exigo, was placed in the Daily Sun on the 14th of November 2016 in accordance with regulation 41(2)(c) and (d) of the EIA Regulations of 2014.

In addition, the availability of the Draft Scoping Report (DSR) for public review was also advertised in the above advert.

9.2. Site notices

In order to inform surrounding communities and adjacent landowners of the proposed development, notice boards (in accordance with regulation 41(2)(a) of the EIA Regulations) were erected at key locations surrounding the project site and within the project area on the 14th of November 2016.

9.3. Direct Notification of Identified I&AP's

Identified stakeholders, who included the following sectors, were directly informed by post, email, fax or sms of the proposed development on the 14th of November 2016:

- The owners and occupiers of land adjacent to the site where the activity is or is to be undertaken or to any alternative site;
- The owners and occupiers of land within 100 m of the boundary of the site or alternative site who are or may be directly affected by the activity;
- Tribal Authorities of Chiefs Isaac Kgoete, Ralph Kgoete, Joyce Kgoete, Frans Magabane, Jack Mahlokoane and Mokgetoa Mpuru
- Limpopo Department of Economic Development, Environment and Tourism (LEDET)
- Department of Mineral Resources (Limpopo)
- Department of Water and Sanitation
- Department of Agriculture, Forestry and Fisheries (DAFF)
- Department of Land Affairs
- Department of Rural Development and Land Reform: Limpopo
- Department of Cooperative Governance Human Settlements and Traditional Affairs (CoGHSTA)

- Lebalelo Water Users Association
- South African Heritage Resources Agency (SAHRA) (Limpopo)
- Municipality Manager from the Sekhukune District Municipality
- Municipality Manager from the Fetakgomo-Greater Tubatse Local Municipality
- ESKOM
- Other mines in the area

On the 11th of November 2016 a notification sms with regards to the availability of the Draft Scoping Report (DSR) for public review was also sent to all stakeholders that had already registered on the project (specifically community members that attended the meetings from 23 to 25 August 2016).

9.4. Public Meetings

Five public meetings have been held in the local communities between the 23rd and the 25th of August 2016. Community members were alerted with regards to the meeting dates and times by means of informing the chiefs and tribal authorities. The meetings were well attended with more than 577 people having attended the meetings.

Meetings were held with the following communities during the pre-application phase:

- Mpuru Community
- Mampahlane Community
- Gamagabane Community
- Mahlokwane Community
- Sehlako Community

The meetings were held to provide I&APs with the opportunity to raise issues and comments and ask specific questions in the presence of the relevant consultants on the project as well as explain the authorisation process and associated timelines. All issues raised by the I&APs during the public meetings are included in Appendix 8.4: Public Meeting and Focus Group Meeting Minutes and Attendance Registers.

9.5. Focus Group Meetings

In order to further ongoing consultations Focus Group meetings (one on one consultation meetings and telephonic consultation) were held with specific landowners, as well as the relevant Government Departments, or are in the process of being arranged as part of the Scoping Consultation Process. The following stakeholders were consulted with:

- Department of Mineral Resources (DMR);
- Department of Water and Sanitation (DWS)

Meetings were requested with district and local municipalities (Sekhukhune District Municipality and Fetakgomo-Greater Tubatse Local Municipality), however the respective representatives stated that meetings were not required at this stage and that they will review the reports provided and provide comments if needed.

Please refer to the meeting minutes of the above focus group meetings as well as Table 5 for more details of the key issues discussed (refer to Appendix 8.4: Public Meeting and Focus Group Meeting Minutes and Attendance Registers). Minutes of future stakeholder focus group meetings will be included in the Final Environmental Impact Report.

9.6. Draft Scoping Report

The EIA Regulations specify that the Draft Scoping Report (DSR) must be subjected to a public participation process of at least 30 days. A period of 30 days (11 November until 12 December 2016) was made available for public comment on the DSR as part of the environmental impact assessment process. The availability of the DSR was announced via advertisement, site notices, sms and notification letters as specified above to all the identified potential I&AP's.

In addition, the DSR was distributed for comment as follows:

- Electronic copies were made available on Dropbox; and
- Hard copies were made available at key locations such as the tribal authority offices
- Hard copies of the report were also made available to the LEDET, DWS and Limpopo Department of Agriculture
- The DMR stated at the pre-application meeting that they did not wish to receive a hard copy of the report and therefore an electronic copy was provided to the department.

9.7. Final Scoping Report

The Draft Scoping Report (DSR) was updated after the draft review period to incorporate the comments received and issues raised by I&APs. The Final Scoping Report (FSR) was submitted to the DMR on 13 January 2017.

9.8. Draft Environmental Impact Report (EIR) and EMPR

The Draft Environmental Impact Report (EIR) and Environmental Management Programme (EMPR) will be made available to I&APs in hard copy and electronic copy (Dropbox website or via email). I&APs will be notified by means of email, registered mail, fax, sms and hand delivery of letters or flyers when the report becomes available.

10. SUMMARY OF ISSUES RAISED BY I&APS

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

THE COMMENTS THAT RELATE TO THE OPENCAST DEVELOPMENT ARE LAREGELY NOT RELEVANT ANYMORE WITH THE CHANGE OF SCOPE OF THE PROJECT. THOSE COMMENTS WERE HOWEVER KEPT IN THE TABLE, BUT SHOULD BE READ BY KEEPING IN MIND THAT THE IMPACTS RELATING TO THE OPENCAST DEVELOPMENT WILL NOT BE APPLICABLE.

Table 5: Comments and Response Table

Interested and Affected Parties	Contact Details	Consulted	Interest/ Capacity	Notification/ Consultation	Issues raised	EAPs response to issues as mandated by the applicant	Consultation Status (consensus, dispute, ongoing, etc.)
Landowners							
MAANDAGSHOEK 254 KT Portion 0	Government of South Africa Private Bag x833 Pretoria 0001 (012) 312 8911 Edzisani.thathana@drdlr.gov.za Fax: 015 230 5204	Consulted during the Scoping Phase. Consulting will continue during the EIA Phase.	Landowner	Via email: On 7 November 2016 a notification of the project was sent to the stakeholder. A meeting will be scheduled with the Department of Land Affairs / Department of Rural Development and Land Reform. Via fax and email: On 9 November 2016 a fax was sent to the DRDLR and emailed to Mr Edzisani Thathana notifying the Department of the availability of the draft Scoping Report.	No comments have been received to date.		Ongoing
Adjacent landowners							
DRIEKOP 253 KT	Government of South Africa Private Bag x833 Pretoria 0001 (012) 312 8911	Consulted during the Scoping Phase. Consulting will continue during the EIA Phase.	Adjacent Landowner	Via email: On 9 November 2016 a notification with regards to the project was sent to the stakeholder. A meeting will be scheduled with the Department of Land Affairs / Department of Rural Development and Land Reform.	No comments have been received to date.		Ongoing
TWYFELAAR 119 KT	Government of South Africa Private Bag x833 Pretoria 0001 (012) 312 8911	Consulted during the Scoping Phase. Consulting will continue during the EIA Phase.	Adjacent Landowner	Via email: On 9 November 2016 a notification with regards to the project was sent to the stakeholder. A meeting will be scheduled with the Department of Land Affairs / Department of Rural Development and Land Reform.	No comments have been received to date.		Ongoing
GROOTHOEK 256 KT Portion 0	Government of South Africa Private Bag x833	Consulted during the	Adjacent Landowner	Via email: On 14 November 2016 a	No comments have been received to date.		Ongoing

Interested and Affected Parties	Contact Details	Consulted	Interest/ Capacity	Notification/ Consultation	Issues raised	EAPs response to issues as mandated by the applicant	Consultation Status (consensus, dispute, ongoing, etc.)
	Pretoria 0001 (012) 312 8911	Scoping Phase. Consulting will continue during the EIA Phase.		notification with regards to the availability of the Draft SR was sent to the stakeholder. A meeting will be scheduled with the Department of Land Affairs / Department of Rural Development and Land Reform.			
MOOIHOEK 255 KT Portion 1 and 2	Government of South Africa Private Bag x833 Pretoria 0001 (012) 312 8911	Consulted during the Scoping Phase. Consulting will continue during the EIA Phase.	Adjacent Landowner	Via email: On 9 November 2016 a notification with regards to the project was sent to the stakeholder. A meeting will be scheduled with the Department of Land Affairs / Department of Rural Development and Land Reform.	No comments have been received to date.		Ongoing
HENDRIKSPLAATS 281 KT	MODIKWA PLATINUM MINE PTY LTD	Notified	Adjacent Landowner	Via email: Notification about EMPR being available sent on 28 June 2017.	No comments have been received to date.		Ongoing
BLACK CHROME MINE	Zoran Marinkovic	Notified	Adjacent Mine	Via email: Notification about EMPR being available for public review sent on 28 June 2017.	No comments have been received to date.		Ongoing
HOEPAKRANTZ 291 KT	Government of South Africa Private Bag x833 Pretoria 0001 (012) 312 8911	Consulted during the Scoping Phase. Consulting will continue during the EIA Phase.	Adjacent Landowner	Via email: On 9 November 2016 a notification with regards to the project was sent to the stakeholder. A meeting will be scheduled with the Department of Land Affairs / Department of Rural Development and Land Reform.	No comments have been received to date.		Ongoing
GARATOUW 282 KT Portion 0	Government of South Africa Private Bag x833 Pretoria 0001 (012) 312 8911	Consulted during the Scoping Phase. Consulting will continue during the EIA Phase.	Adjacent Landowner	Via email: On 9 November 2016 a notification with regards to the project was sent to the stakeholder. A meeting will be scheduled with the Department of Land Affairs / Department of Rural Development and Land Reform.	No comments have been received to date.		Ongoing
DE KOM 252 KT	Government of South Africa Private Bag x833 Pretoria 0001 (012) 312 8911	Consulted during the Scoping Phase. Consulting will continue during the EIA Phase.	Adjacent Landowner	Via email: On 9 November 2016 a notification with regards to the project was sent to the stakeholder. A meeting will be scheduled with the Department of Land Affairs / Department of Rural	No comments have been received to date.		Ongoing

Interested and Affected Parties	Contact Details	Consulted	Interest/ Capacity	Notification/ Consultation	Issues raised	EAPs response to issues as mandated by the applicant	Consultation Status (consensus, dispute, ongoing, etc.)
				Development and Land Reform.			
Government Departments							
Limpopo Department of Economic Development, Environment and Tourism (LEDET)	Ms M. C. Rodgers Environmental Impact Management (EIM) Capricorn District Tel: 015 290 7146 Email: RodgersMC@ledet.gov.za	Consulted during the Scoping Phase. Consulting will continue during the EIA Phase.	Government Department	Via email: On 14 November 2016 a notification with regards to the availability of the Draft SR was sent to the stakeholder. A meeting will be scheduled with the Department.	Via letter from M. Motlapo compiled on 16 January 2017: • The Department stated that it does not have an objection to the proposed development. The project should take into account the mitigation hierarchy – avoidance or prevention, minimise, rehabilitate and offsets. • The Department urged the applicant to utilise available developed environmental tools such as the OLEMF and Mining Biodiversity Guidelines. • Greater Sekhukhune has sensitive areas of environmental importance which need to be conserved and managed properly. It should be confirmed whether the proposed mining activity falls outside environmental areas (e.g. Mpumalanga Biodiversity Conservation Plan, Sekhukhuneland Centre of Endemism) which cannot withstand planned or future proposed mining activity, since a diversity of important endemic trees and plants can be found in such area(s).	• Noted. The opencast development was removed from the application. The only infrastructure now proposed is new Pollution Control Dams (PCDs) and associated structures (e.g. silt traps and channels). The one PCD (PCD2) was originally proposed for a drainage line as it was the lowest point in the landscape, however it was moved to a partly disturbed site approximately 100m away, thereby taking the principles of avoiding environmental destruction into account. • Environmental best practice was taken into account when considering the placement of the PCDs. In addition to the comment above; PCD1 will also be located in on disturbed area. • The site forms part of the Sekhukhuneland Centre of Endemism The proposed PCDs will however all be located within an existing mining area and are already largely disturbed from mining related activities. The Ecological Impact Report by Dr. Buks Henning states the following regarding the PCD sites: The mining project is located in the following areas: o PCD1 is located in a CBA1; o PCD2 is located in an ESA1 area. The management objective for these areas is to maintain ecosystem functionality and connectivity allowing for limited loss of biodiversity pattern. The ESA areas should be managed for sustainable development and therefore the site is suitable from the LCPv2 guidelines.	Ongoing
South African Heritage Resources Agency: Limpopo	Mr. Philip Hine P.O. Box 2771 Cape Town 8000 (021) 465 2198 Fax: (021) 465 5789 phine@sahra.org.za Notification also submitted on the SAHRIS website.	Consulted during the Scoping Phase. Consulting will continue during the EIA Phase.	Government Agency	Via email: On 14 November 2016 a notification with regards to the availability of the Draft SR was sent to the stakeholder.	Via email: On 12 December 2016 a letter from SAHRA was received in which it provided the following comments: • SAHRA supports the recommendation for ground-penetrating radar for the “rectangular stone structure” and awaits the results of the report	Comment by the EAP: • The site where the ‘rectangular structure’ was found was within the footprint of one of the open pits on Hill 3. Opencast mining is however not going to go ahead and was removed	Ongoing

Interested and Affected Parties	Contact Details	Consulted	Interest/ Capacity	Notification/ Consultation	Issues raised	EAPs response to issues as mandated by the applicant	Consultation Status (consensus, dispute, ongoing, etc.)
					before construction begins on site. • SAHRA exempts the developer from commissioning a Palaeontological Impact Assessment.	from the terms of reference of this application. The structure will therefore not be impacted at all. • Noted	
Department of Water and Sanitation - Limpopo	Mr. A Ramalisa Private Bag X11259 NELSPRUIT 1200 (013) 235 4206 Fax: 013 235 4745 Fax2letter: 086 215 7051 RamalisaA@dwa.gov.za	Consulted during the Scoping Phase. Consulting will continue during the EIA Phase.	Government Department	Via email: On 14 November 2016 a notification with regards to the availability of the Draft SR was sent to the stakeholder. A meeting will be scheduled with the Department.	A consultation meeting was undertaken with the DWS on 29 November 2016. Minutes of the meeting is attached to Appendix 6. The following is a summary of the comments that were given by Adam Ramalisa from DWS: • The exact boundaries of the open pits will need to be indicated in the application and reports. The mining method needed to be explained. • Leachate tests should be done to assess the impact from the overburden dumps and the liner requirements. • It may not be good practice to add the dirty stormwater to the TDF.	Comment by EAP: • The open pit development has been excluded from the project scope. • No overburden dumps are proposed anymore as opencast mining will not be extended. • Using the TDF as a stormwater facility is not the preferred alternative anymore. A separate PCD is proposed to be constructed (PCD2).	Ongoing
Department of Agriculture, Forestry and Fisheries (DAFF) Branch: Forestry	Mr. Thembani Makhuvele Mr. Kenny Moabelo Private Bag X9487 Polokwane 0700 (015) 294 3103 Fax: (015) 294 4506 makhuvelest@agric.limpopo.gov.za kmoabelo@gmail.com	Consulted during the Scoping Phase. Consulting will continue during the EIA Phase.	Government Department	Via email: On 14 November 2016 a notification with regards to the availability of the Draft SR was sent to the stakeholder.	No comments have been received to date.		Ongoing
Department of Agriculture and Rural Development: Limpopo	Mrs Ephenia Kekana Private Bag X28 Chuenespoort 0745 (015) 632 8600/8611 Fax: (015) 632 6303/4500 Kekana.ephenia@gmail.com	Consulted during the Scoping Phase. Consulting will continue during the EIA Phase.	Government Department	Via email: On 14 November 2016 a notification with regards to the availability of the Draft SR was sent to the stakeholder. A meeting will be scheduled with the Department.	No comments have been received to date.		Ongoing
Department of Mineral Resources (DMR)	Mr. Thivhulawi Kolani Private Bag X9467 Polokwane 0700 (015) 287 7000 Fax: (015) 287 4729 Thivhulawi.Kolani@dmr.gov.za	Consulted during the Scoping Phase. Consulting will continue during the EIA Phase.	Government Department	Via email: On 14 November 2016 a notification with regards to the availability of the Draft SR was sent to the stakeholder. A meeting will be scheduled with the Department.	Letters acknowledging receipt of the Application and Scoping Report, as well as the extension request were received and area attached to Appendix 9.5.		Ongoing
SANRAL - Northern Region	Regional Manager Private Bag X17 Lynnwood Ridge 0040 (012) 426 6200 Fax: (012) 348 1512	Consulted during the Scoping Phase. Consulting will continue		Via email: On 14 November 2016 a notification with regards to the availability of the Draft SR was sent to the stakeholder.	No comments have been received to date.		Ongoing

Interested and Affected Parties	Contact Details	Consulted	Interest/ Capacity	Notification/ Consultation	Issues raised	EAPs response to issues as mandated by the applicant	Consultation Status (consensus, dispute, ongoing, etc.)
		during the EIA Phase.					
Roads Agency Limpopo	Private Bag X9554 Polokwane 0700 (015) 284 4600 Fax: 015 284 4701 info@ral.co.za RAL Limpopo P.E. Montjane 015 284 4637 montjanePE@ral.co.za	Consulted during the Scoping Phase. Consulting will continue during the EIA Phase.		Via email: On 14 November 2016 a notification with regards to the availability of the Draft SR was sent to the stakeholder.	No comments have been received to date.		Ongoing
Limpopo Department of Roads and Transport	Pinky Kekana Private Bag X9491 Polokwane 0700	Consulted during the Scoping Phase. Consulting will continue during the EIA Phase.	Government Department	Via email: On 14 November 2016 a notification with regards to the availability of the Draft SR was sent to the stakeholder.	No comments have been received to date.		Ongoing
Limpopo Department of Roads and Transport	Tshikonelo Ndiitwani Manager: Environmental Management Private Bag X9491 Polokwane 0700 Tel: 015 295 1033 Cell: 071 670 0099 Fax: 015 294 8116 tshikonelon@drt.limpopo.gov.za	Consulted during the Scoping Phase. Consulting will continue during the EIA Phase.	Government Department	Via email: On 14 November 2016 a notification with regards to the availability of the Draft SR was sent to the stakeholder.	No comments have been received to date.		Ongoing
Department of Land Affairs / Department of Rural Development and Land Reform	Limpopo Province Land Reform Office Private Bag X9312 Polokwane 0700 Mr Edzisani Thathana Edzisani.thathana@drdlr.gov.za Fax: 015 230 5204	Consulted during the Scoping Phase. Consulting will continue during the EIA Phase.	Government Department	Via email: On 7 November 2016 a notification of the project was sent to the stakeholder. A meeting will be scheduled with the Department of Land Affairs / Department of Rural Development and Land Reform. Vis fax and email: On 9 November 2016 a fax was sent to the DRDLR and emailed to Mr Edzisani Thathana	No comments have been received to date.		Ongoing
Department of Rural Development and Land Reform: Limpopo	Office of the Regional Land Claims Commissioner: Limpopo Pfumelan Tsedu T.A. Maphoto Private Bag X9552 Polokwane 0700 (015) 284 6300 Fax: (015) 295 7404/7403	Consulted during the Scoping Phase. Consulting will continue during the EIA Phase.	Government Department	Via email: On 14 November 2016 a notification with regards to the availability of the Draft SR was sent to the stakeholder.	No comments have been received to date		Ongoing
	Josias Ramathebane Josias.ramathebane@drdlr.gov.za	Consulted during the Scoping	Government Department	Via email: On 14 November 2016 a notification with regards to	No comments have been received to date		Ongoing

Interested and Affected Parties	Contact Details	Consulted	Interest/ Capacity	Notification/ Consultation	Issues raised	EAPs response to issues as mandated by the applicant	Consultation Status (consensus, dispute, ongoing, etc.)
	0824838034	Phase. Consulting will continue during the EIA Phase.		the availability of the Draft SR was sent to the stakeholder.			
	Mpobonyane Oldoria Rampora Mpobonyane.rampora@drdlr.gov.za	Consulted during the Scoping Phase. Consulting will continue during the EIA Phase.	Government Department	Via email: On 14 November 2016 a notification with regards to the availability of the Draft SR was sent to the stakeholder.	No comments have been received to date		Ongoing
	Jacob Tshabangu (015) 287 2600	Consulted during the Scoping Phase. Consulting will continue during the EIA Phase.	Government Department	Via email: On 14 November 2016 a notification with regards to the availability of the Draft SR was sent to the stakeholder.	No comments have been received to date		Ongoing
Department of Cooperative Governance Human Settlements and Traditional Affairs (CoGHSTA)	Private Bag X9485 Polokwane 0700 (015) 294 2000 (015) 295 4190 Palmero@coghsta.limpopo.gov.za	Consulted during the Scoping Phase. Consulting will continue during the EIA Phase.	Government Department	Via email: On 14 November 2016 a notification with regards to the availability of the Draft SR was sent to the stakeholder.	No comments have been received to date		Ongoing
Municipalities							
Sekhukhune District Municipality	Acting Municipal Manager: Mrs. MF Mokoko Private Bag X8611 Groblersdal 0470 (013) 262 7300 Fax : (013) 262 4303 mahlangug@sekhukhune.gov.za seoketsam@sekhukhune.gov.za sekinfo@sekhukhune.co.za Ms. Pilusa Pilusab@sekhukhune.gov.za Mr. Mphahlele Mphahlelep@sekhukhune.gov.za SLedwaba@environment.gov.za	Consulted during the Scoping Phase. Consulting will continue during the EIA Phase.	District Municipality	Via email: On 7 November 2016 Mr. Mphahlele spoke to the mine's community liaison officer, Mr Macmillan Motimele, via telephone whom provided a brief overview of the project and stated that Exigo would like to consult with him. Mr Gildenhuys from Exigo subsequently contacted Mr. Mphahlele via telephone, provided more information with regards to the project via email and also requested that the department consult with Exigo in a method that they prefer. Mr Mphahele requested Mr Gildenhuys to send the relevant information to himself, Ms. Pilusa and also copy in	No comments have been received to date.		Ongoing

Interested and Affected Parties	Contact Details	Consulted	Interest/ Capacity	Notification/ Consultation	Issues raised	EAPs response to issues as mandated by the applicant	Consultation Status (consensus, dispute, ongoing, etc.)
				SLedwaba@environment.gov.za. On 14 November 2016 a notification with regards to the availability of the Draft SR was sent to the stakeholder. A meeting will be scheduled with the Municipality.			
Fetakgomo-Greater Tubatse Local Municipality	Municipal Manager: Mohlala JNT P.O. Box 206 Burgersfort 1150 1 Kastania Street, Burgersfort (013) 321 1000 Fax: (013) 231 7467 Mr. Sekgobela Sjsekgobela@tubatse.gov.za	Consulted during the Scoping Phase. Consulting will continue during the EIA Phase.	Local Municipality	Via email: On 3 November 2016 Mr. Sekgobela met the mine's community liaison officer, Mr Macmillan Motimele, whom provided a brief overview of the project and requested a meeting with him for the 21st of November 2016. Mr Gildenhuys from Exigo subsequently contacted Mr, Sekgobele via telephone, provided more information with regards to the project via email and also requested the meeting via email. Focus Group meeting scheduled for the 21st of November at 14h00. On 14 November 2016 a notification with regards to the availability of the Draft SR was sent to the stakeholder. A meeting will be scheduled with the Municipality.	No comments have been received to date.		Ongoing
Ward Councillors							
Fetakgomo-Greater Tubatse Local Municipality Ward 11	Mr Magane MT –Ward 11 - 0794555016 1 Kastania Street Fetakgomo- Greater Tubatse Municipality Burgersfort P.O Box 206 Burgersfort 1150	Consulted during the Scoping Phase. Consulting will continue during the EIA Phase.	Local Municipality	Via email: On 14 November 2016 a notification with regards to the availability of the Draft SR was sent to the stakeholder. A meeting will be scheduled with the Municipality.	No comments have been received to date.		Ongoing
Fetakgomo-Greater Tubatse Local Municipality Ward 12	Mahlake PV – Ward 12-0724193366 1 Kastania Street Fetakgomo- Greater Tubatse Municipality Burgersfort	Consulted during the Scoping Phase. Consulting will continue during the	Local Municipality	Via email: On 14 November 2016 a notification with regards to the availability of the Draft SR was sent to the stakeholder. A meeting will be scheduled with the	No comments have been received to date.		Ongoing

Interested and Affected Parties	Contact Details	Consulted	Interest/ Capacity	Notification/ Consultation	Issues raised	EAPs response to issues as mandated by the applicant	Consultation Status (consensus, dispute, ongoing, etc.)
	P.O Box 206 Burgersfort 1150	EIA Phase.		Municipality.			
Other							
ESKOM	Regional Manager of Land Development (Limpopo) PO Box 1091 Johannesburg 2001	Consulted during the Scoping Phase. Consulting will continue during the EIA Phase.		Via email: On 14 November 2016 a notification with regards to the availability of the Draft SR was sent to the stakeholder.	Mr ZS Maqubela from Eskom Land Management had the following comment: I refer to your letter dated 23 January 2017 and wish to inform you that Eskom Transmission (Tx) is not affected by this application. Eskom Dx services are affected and an application must be submitted to Eskom Limpopo Region, the contact person is Mr Xander Neethling.	A notification letter was sent to Mr Neethling. No response received up to date.	Ongoing
	Mr Xander Neethling Distribution Division (The Land Development & Environmental Management) PO Box 3499 Polokwane 0700 Tel: 015 299 0527 neethx@eskom.co.za	Consulted during the Scoping Phase. Consulting will continue during the EIA Phase.		Via email: On 14 November 2016 a notification with regards to the availability of the Draft SR was sent to the stakeholder.	No comments have been received to date.		Ongoing
ESKOM Polokwane	Keneuoe Moamogwe Key Customer Executive Transmission (Key Sales and Customer Service) Division Tel: 015 299 0374 Fax: 8451 5374 Cell: 0834410380 Web Fax: 0866566843 Keneuoe.Moamogwe@Eskom.co.za	Consulted during the Scoping Phase. Consulting will continue during the EIA Phase.		Via email: On 14 November 2016 a notification with regards to the availability of the Draft SR was sent to the stakeholder.	No comments have been received to date.		Ongoing
AGRI Limpopo	Mabilu Tyrone PO Box 735 Fauna Park Polokwane 699 MabiluMT@agric.limpopo.gov.za	Consulted during the Scoping Phase. Consulting will continue during the EIA Phase.		Via email: On 14 November 2016 a notification with regards to the availability of the Draft SR was sent to the stakeholder.	No comments have been received to date.		Ongoing
Tribal Authorities / Community Members / Chiefs/ Other Interested and Affected Parties							
Lebalelo Water Users Association	ML Sales (Malcolm) Technical Manager Company name: Lebalelo Water User Association (LWUA) Company address: Postal address: PO Box 2075	Consulted during the Scoping Phase. Consulting will continue		Via sms: On 11 November 2016 a notification with regards to the availability of the Draft SR was sent to the stakeholder.	No comments have been received to date.		Ongoing

Interested and Affected Parties	Contact Details	Consulted	Interest/ Capacity	Notification/ Consultation	Issues raised	EAPs response to issues as mandated by the applicant	Consultation Status (consensus, dispute, ongoing, etc.)
	Polokwane 0700 Telephone number: 013 216 8000 Mobile number: 082 462 7379 Fax number: 013 216 8003 E-mail address: malcolm@lebelelo.co.za	during the EIA Phase.					
Lebalelo Water Users Association	H Masete (Hendrik) Member of LWUA Representing communities Company name: Company address: Postal address: PO Box 2075 Polokwane 0700 Telephone number: 013 216 8000 Mobile number: 072 341 0834 Fax number: 013 216 8003	Consulted during the Scoping Phase. Consulting will continue during the EIA Phase.		Via sms: On 11 November 2016 a notification with regards to the availability of the Draft SR was sent to the stakeholder.	No comments have been received to date.		Ongoing
Pulana Maroga	Contact person: Madigage SN 073 473 6380	Consulted during the Scoping Phase. Consulting will continue during the EIA Phase.		Via sms: On 14 November 2016 a notification with regards to the availability of the Draft SR was sent to the stakeholder.	No comments have been received to date.		Ongoing
Kwena Mafolo	Contact person: Mogotho LM 076 285 4558	Consulted during the Scoping Phase. Consulting will continue during the EIA Phase.		Via sms: On 14 November 2016 a notification with regards to the availability of the Draft SR was sent to the stakeholder.	No comments have been received to date.		Ongoing
Twako Mohlala	Contact person: Mokoele SR 082 255 6819	Consulted during the Scoping Phase. Consulting will continue during the EIA Phase.		Via sms: On 14 November 2016 a notification with regards to the availability of the Draft SR was sent to the stakeholder.	No comments have been received to date.		Ongoing
Bakoni Phuti	Contact person: Sekopa GC 078 592 8764	Consulted during the Scoping Phase. Consulting will continue during the EIA Phase.		Via sms: On 14 November 2016 a notification with regards to the availability of the Draft SR was sent to the stakeholder.	No comments have been received to date.		Ongoing
		Yes		Via sms: On 14 November 2016 a notification with regards to the availability of the Draft SR was sent to the stakeholder.	No comments have been received to date.		Ongoing

Interested and Affected Parties	Contact Details	Consulted	Interest/ Capacity	Notification/ Consultation	Issues raised	EAPs response to issues as mandated by the applicant	Consultation Status (consensus, dispute, ongoing, etc.)
Edward			Attended the meeting held on the 24th of August 2016 with the Gamagabane Tribal Authority		• Edward noted that he is sad and disappointed to hear what Abel Mbule is saying as a company, that opencast and not underground is planned since underground mining provides many jobs. He noted that they are not skilled to work at opencast at Maandagshoek and he referred to an incident where someone was killed by rocks. • He reiterated that opencast mining does not require labour and the community will not benefit. He noted that this is a fact and the mine is not addressing the current issue at the village of Maapaye where houses are close to the mine. • He objected to the proposed project as it will not be useful to their community and he requested that the EIA be suspended since it will not benefit this community, in his opinion. • Edward commented on the mine and opencast running concurrently and asked why development is behind. He asked why people employed at the panel (?) show a lack of skill as compared to with people responsible for planning at the mine. • Edward further noted that, as the community, they are undermined and not given skills or developed by the mine. He asked when the community will be provided with the necessary skills similar to those with people from Natal or the Eastern Cape Province. He continued to say that everything that is done at the mine, can be done by any other person, as long as they are trained. He again asked when training for locals will be done since they don't have the skills to work at the opencast mine.	At the public meeting Abel Mbule responded that the delays were due to previous development problems such as breakdowns and new machines only received last year. He noted that after machines were in action, the mine produced 30 000t months and January / February were good months but the downfall was machines. The opencast development that was proposed will not go ahead anymore.	Ongoing

Interested and Affected Parties	Contact Details	Consulted	Interest/ Capacity	Notification/ Consultation	Issues raised	EAPs response to issues as mandated by the applicant	Consultation Status (consensus, dispute, ongoing, etc.)
					• He concluded to say that they as community members require to be treated with respect as residents of Maandagshoek. What happened in the past was a result of racism and discrimination.		
Innocent Sehlahla			Attended the meeting held on the 24th of August 2016 with the Gamagabane Tribal Authority		• Innocent noted that he is an ex-employee of the Phokathaba mine. • He asked how long the opencast will operate, until they open underground mine. • He asked how many locals will be employed in the opencast operations. • He noted that previously there were talks of 10% shareholding and he asked who the custodian of that account and those shared are.	Abel Mbule noted that they are busy with the scope of the opencast - once scope has been finalised they will know how many people will be employed for underground and opencast labour. Abel Mbule noted that opencast in not a new application, it's an expansion to increase production; the 10% will remain and cannot be changed. The opencast development that was proposed will not go ahead anymore.	Ongoing

Interested and Affected Parties	Contact Details	Consulted	Interest/ Capacity	Notification/ Consultation	Issues raised	EAPs response to issues as mandated by the applicant	Consultation Status (consensus, dispute, ongoing, etc.)
Molefe Julius Mashilo			Attended the meeting held on the 24th of August 2016 with the Gamagabane Tribal Authority		• Julius also enquired about the 10% shareholding and he asked how many % of this will go to the community, from the opencast operations. He asked who receives the 10% money. • He also asked how long opencast mining run will until underground operations will start. • He wanted to know what is happening to people who were trained by the mine and never received certificates. • He commented that he hopes it will be possible that when the opencast takes off, they will get some jobs in the opencast process since they need that. • Julius asked by Hill2 & Hill 3 will be mined and not Hill 1 since this hill has got potential • Julius also noted that there are some graves in the area where the opencast is intended and he suggested the mine talk to tribal authority with regards to those graves. • Julius concluded by asking clarification on the between 400m and 500m distances from villages.	Abel Mbule replied that Hill 1 does not fall on their property. Abel Mbule asked community members to come forward and identify grave locations so that the mine can follow due process. He ensured the community that graves and burials will not be disrespected. The opencast development that was proposed will not go ahead anymore.	Ongoing
Mareng Mafolo			Attended the meeting held on the 24th of August 2016 with the Gamagabane Tribal Authority		• Mareng asked what forced the mine to take the opencast route.		Ongoing
Abraham Maboboane			Attended the meeting held on the 24th of August 2016 with the Gamagabane Tribal Authority		• Abraham wanted to know whether the mine management knew what challenges were left behind by Platinum Australia when they left in 2010. • He noted that there are some houses affected from that time; those households have not received anything to date	Abel Mbule noted that itis not true; it was one complaint from Mr Beshego. The mine investigated by going to house, taking pictures and doing a survey. They found no signs that the mine had an effect on the cracks at the house and this information was communicated to him and also to the tribal leaders. Old and new pictures were displayed and cracks were the same. Abel Mbule noted that houses will be surveyed before blasting and if it is evident that the blasting caused	Ongoing

Interested and Affected Parties	Contact Details	Consulted	Interest/ Capacity	Notification/ Consultation	Issues raised	EAPs response to issues as mandated by the applicant	Consultation Status (consensus, dispute, ongoing, etc.)
					• Abraham noted that their livestock got sick because they drank water from the mine “excrete: • Abraham asked whether the mine management was aware of the fact that Platinum Australia dismissed employees without being compensated at the mine	cracks it is the responsibility of the mine to fix such houses. Abel Mbule noted that this is the first time to get that complaint at a public meeting and he said that there is a complaint book at the gate which is regularly checked, and no such complaint has arisen. He assured all that the issue will be investigated. Abel Mbule noted that they are busy engaging with this group of employees dismissed during JIC operations. He noted that they asked assistance from Labour Departments in this regard and where there is proof provided no fault on the side if the mine was noted. The issue is currently on the table.	
Lebohang Selepe			Attended the meeting held on the 24th of August 2016 with the Gamagabane Tribal Authority		• Lebohang referred to opening opencast and the shortage of “15 000” and asked what the mine would do to ensure that the full capacity will be fulfilled after opencast is closed.	Abel Mbule replied that in these 12 months, underground will be advanced and more reserves will be opened in order to supply the demand after the 12 months. The opencast development that was proposed will not go ahead anymore.	Ongoing
Alfred Phokwane			Attended the meeting held on the 24th of August 2016 with the Gamagabane Tribal Authority		• Alfred noted that it was previously indicated that the mine is going to be re-opened but now it is said that only opencast will be opened for 12 months, and he feels that they are being fooled.	Abel Mbule explained the 30 000t and 60 000t scenario again. In the previous year only 30k was mined and they have looked at a plan to improve production measures to increase production. To get to 60 000t, 15 000t from opencast is needed, but running simultaneously and concurrently. He noted that, depending on the approach, they will decide on appointments but the mining needs to occur concurrently. He explained that the reason for opencast is to move the waste away and reach the ore. This is also the plan that is sold to the investors.	Ongoing

Interested and Affected Parties	Contact Details	Consulted	Interest/ Capacity	Notification/ Consultation	Issues raised	EAPs response to issues as mandated by the applicant	Consultation Status (consensus, dispute, ongoing, etc.)
					• Alfred asked how many of previously dismissed / retrenched employees will be redeployed if opencast is done. • Again, he asked how many tonnes will be realised from the opencast to augment production. • As a general comment, Alfred said that the mine talks about employing locals because they employ local people but then they are dismissed. He says the mine talks about capacitation locals but they use others at the mine.		
Malobeng (?)			Attended the meeting held on the 24th of August 2016 with the Gamagabane Tribal Authority		• Malobeng made a general comment by saying that the mine and consultants are confusing the community as these parties say they want to reopen mine but only opencast for 12 months.		Ongoing
Mokwena			Attended the meeting held on the 24th of August 2016 with the Gamagabane Tribal Authority		• Mokwena expressed his amazement that this is a new “table” altogether from the delegation that initially visited the community. He said that it is not true that the house in question had cracks prior to the mine. He noted that chrome was mined previously and were sold off. He added that he is from the retrenched group and they have never been called.		Ongoing
Lazarus			Attended the meeting held on the 24th of August 2016 with the Gamagabane Tribal Authority		• Lazarus said that he is very sad since there is no truth in everything said by the mine. He indicated that he had gone to the other meeting also, and there it was said that the dust is not even harmful to the community. He is of the opinion that the mine came to the villages just to get the mine going but with no regard for the community. He noted that it might be that the mine were told that people from Maandagshoek is not learned (are not educated?) and stupid and don’t know anything.	Abel Mbule responded on the issue of the dust by saying that the speaker at that meeting was referring to silicosis from gold mines. Abel Mbule reiterated that he even said for the dust issue they are taking it seriously, that is why there are monitoring buckets for the dust and supressing systems at the tailings dam.	Ongoing

Interested and Affected Parties	Contact Details	Consulted	Interest/ Capacity	Notification/ Consultation	Issues raised	EAPs response to issues as mandated by the applicant	Consultation Status (consensus, dispute, ongoing, etc.)
Lina Mamogale			Attended the meeting held on the 24th of August 2016 with the Gamagabane Tribal Authority		• Lina wanted to know who the people / contractors / employed for the opencast will be and if these people would be from outside or locals. • She pleaded that operations commence as soon as possible because they really need these jobs.		Ongoing
P.P Mohlala			Attended the meeting held on the 24th of August 2016 with the Gamagabane Tribal Authority		- Mr Mohlala raised a concern that boreholes at schools could be contaminated by mine.	Abel Mbule responded that water at schools is monitored and that according to DWA regulations certain elements need to be monitored specifically. He said that Ecoli was picked up and they took the necessary steps but it is not the mine's responsibility to care for household water at houses and to advise community members on water use. He noted that communities can be referred to specialist who will confirm that water to the community is healthy.	Ongoing
Mogadi Phala			Attended the meeting held on the 24th of August 2016 with the Gamagabane Tribal Authority		• Mogadi enquired about the agreement according to which mined chrome would be made available to communities to be sold. She asked why chrome is not made available to communities because only platinum is mined. • She asked if the mine is instilling fear in the community since, to her knowledge, the LOM is 7 years but it was now said that opencast is going to be for 1 year. • She requested to discuss with the issues raised at the meeting with the community and local council. She indicated that, as a community they might agree or disagree on some issues, only to find that some agreements with other tribal authorities might exist. As such, she noted that it is necessary to discuss the issues with other tribal authorities and to give feedback to community members on issues and resolves.	Abel Mbule replied that chrome is stockpiled. After some of the resource went into the tailings dam it was decided to stockpile to provide for this opportunity. Abel Mbule made a general comment that the trust will assist with skills development and contractors, also in terms of procurement. Herman Gildenhuys responded to the process that is followed. He said that a meeting was held with DMR. They advised what should be done and which parties to involve in meetings. They advised to first meet with the communities and then with the local municipalities. He indicated that they will meet with municipalities, DWA and DEE and Tourism as soon as application has been made. Once reports have been written it will be available and community members will have access and can provide feedback, and the consultant will come back and meet with communities on issues in the reports. Advertisement will be placed and stakeholders will be notified by sms that process has started. Just want to thank everybody, investigate comments and come back to you.	Ongoing

Interested and Affected Parties	Contact Details	Consulted	Interest/ Capacity	Notification/ Consultation	Issues raised	EAPs response to issues as mandated by the applicant	Consultation Status (consensus, dispute, ongoing, etc.)
Unknown community members:			Attended the meeting held on the 24th of August 2016 with the Gamagabane Tribal Authority		- A number of community members pleaded with the larger community to allow opencast mining to allow for some job opportunities.	Abel Mbule made a general comment about safety concerns with women at the gate, referring to the tragedy that took place at the gate some time ago. He noted that they will ill look at alternative means for them.	Ongoing
					• A number of community members raised the issue of chrome. They noted that Phokathaba indicated that chrome belonged to the community.	Abel Mbule responded by saying that with ASA allegedly having chrome rights, there was a follow up to find that they does have a chrome right but not not for LD2 but LD6. The person who holds the chrome rights could not be located and the agreement was stopped. He assured the community that a resolve on this will be communicated as soon as a conclusion is reached.	Ongoing
					• Community members indicated confusion over expired mining right and licence, and new mining right applications.	Abel Mbule answered that the MR is still valid and it expires at the end 2017. It is still held by Phokathaba as indicated on the brochure.	Ongoing
					• A community member noted that the global platinum price is low and asked if the mine would close again if the price deteriorated more.	Abel Mbule replied that they do not have an influence over this but the mine can react to it, similar to the petrol price. He noted that one needs to expect these fluctuations and have control measures in place for that for that. He said that they will look at the markets and decide after 3 months but an answer is not possible now.	Ongoing
Happy Mohlala			Attended the meeting held on the 23rd of August 2016 with the Konephuti Tribal Authority		• Mr Mohlala requested to be put on the record that permission should be acquired before putting voice recording on the agenda / plan. • Mr Mohlala expressed confusion over whether the mine will be restarted or whether it this process is a new start for the mine. He explained that his concern was if a new mine is established it will entail new ownership and all agreements and percentages will have to be discussed afresh. • Mr Mohlala enquired about possibilities for employment and the role of interested businesses? - Mr Mohlala suggested that a workshop be held prior to future and similar meetings so that everybody will know what the mine is talking about.	Herman Gildenhuys noted that the intention was not to record the proceedings prior to permission from stakeholders. Herman Gildenhuys replied that that this is an extension of the existing open pits subject to the same mining right. Ownership remains the same and all agreements will remain unchanged. Herman Gildenhuys noted that the Social Impact Assessment will address these issues in detail in terms of l opportunities, business etc. Herman Gildenhuys responded that this will be discussed with AB in order to explain everything, and regarding findings. AB noted that a trust is being formed but this is a public participation process and the mine needs to come to the public with the project. This is also why the community at large needs to participate. He explained that the trust will be finalized and issues will be advanced when in the trust is existing.	Ongoing

Interested and Affected Parties	Contact Details	Consulted	Interest/ Capacity	Notification/ Consultation	Issues raised	EAPs response to issues as mandated by the applicant	Consultation Status (consensus, dispute, ongoing, etc.)
					- Mr Mohlala referred to the formation of trusts and the fact that trusts are not functional, yet the mine is pursuing the processes. He asked who would take charge of the trusts while the process is ongoing. - Mr Mohale asked if a document could be made available where the community could write decisions and comments before the final report is submitted to the Department. He also noted that, since the mine is in existence, there should be active community projects in place, and he requested AB mention some of these. - Mr Mohale concluded by saying that dust is a problem and he expressed a wish that in due course, that Phokathaba will tar gravel roads in the area.	AB (AM Abel Mbule)? replied that the mine needs the input of the communities and all comments are welcome; they will get the opportunity to comment and these comments will be incorporated into the scoping report. He said that he will comment later on projects. AB responded that air quality is monitored by the mine and impacts will be assessed. He noted that road construction is the prerogative of the mine and it remains their decision. With regards to mine programmes, AB noted that there is an approved EMPR in place which is still valid. This document governs the mine in terms of environmental issues. That is the governing project taking care of the environment from the mine's side. AB explained that dust is an impact when opencast mining is done and the mine takes cognisance thereof. He called on the community not to mix dust impacts from mining, with dust from roads. He noted that the latter will be part of the SLP. He then addressed the issue of waste management and explained that, when mining is done rock that does not contain mineral is referred to as waste. This waste will be used to fill existing opencast pits. Domestic waste will be looked at as part of the SLP for the community.	
Albert Monyela			Attended the meeting held on the 23rd of August 2016 with the Konephuti Tribal Authority		- Albert noted that the mine was managed by other people in the past but now they ran away with the money of employees. He requested that the mine follow up on monies and consider hiring these people.	On Mr Monyela's issue about former employee, Abel Mbule noted is that this problem was referred to the DIC and it was dismissed by this body. There have been talks with involved employees, they have consulted with the department of labour and their issues have been resolved. Abel Mbule assured all that there will be continued engaging on this issue. He stressed that the mine has a duty to abide by the laws of the country in terms of the environment and labour. Abel Mbule reiterated that employee issues are part of the labour requirements but this meeting was called to address Enviromental concerns. Abel Mbule noted that the SIA will address these requests and this will be a mitigation measure. Abel Mbule now addressed the question about outside employees who is transported to the mine with busses from e.g.	Ongoing

Interested and Affected Parties	Contact Details	Consulted	Interest/ Capacity	Notification/ Consultation	Issues raised	EAPs response to issues as mandated by the applicant	Consultation Status (consensus, dispute, ongoing, etc.)
					- Albert appealed to the mine to consider employing local people and not outside people, especially previous employees of the mine. - Albert commented that they are not happy with the strikes because it derails progress and they need their children to work. He noted that he is grateful and thankful that a job opportunity is coming home but he pleaded for water services first. He requested that "young ones" are trained before they are employed. - Albert asked about people who live close to the mine, and whether new houses will be built for them.	Malukela. He reminded the community that and agreement has been signed according to which 60% of labour will be local and 40% of labour will be from other areas. He noted that they engaged with the labour desk whereby it was decided that if required skills are not available in house, they will consider neighbouring communities. He stressed that this was not an Environmental issue and it will be addressed when the trust is formed. Herman Gildenhuys noted that he cannot really comment on this. Abel Mbule assured the community that they will apply all means to avoid strikes and such dealings. On a request for water and roads infrastructure he noted that this will be investigated in the updated SLP. He further agreed that training is necessary since it is also a legal requirement and the mine will commit to that On the issue of the relocation of communities in close vicinity of opencast Abel Mbule noted that they are guided by the law which requires a 500m radius around opencast workings but they also looked at the lower radius of 400m. He noted that a risk assessment in conjunction with communities will be conducted and he explained that 2 options were available; either relocate or exclude mining in risk areas. He indicated on the hand-out maps that a radius of 500m is indicated and the stressed that the risk assessment will be crucial.	
Petros Kgoikjane			Attended the meeting held on the 23rd of August 2016 with the Konephuti Tribal Authority		- Petros referred back to a discussion on graves in the area and he noted that, in 1947 his family had a water well at Phokathaba. This well has been assisting him in terms of health problems and illnesses because once he arrived there and got a cup of water, he was relieved. He indicated that it is currently difficult for him to obtain that water. He also asked about the performance of ancestral rituals and what the	Abel Mbule noted Petros Kgoikjane's concern about a well on the property and said that that place is now occupied and there are a lot of laws applicable here but Mr Kgoikjane should discuss this further with Abel Mbule. Abel Mbule noted that he realised that this community is not part of jurisdictions and employment is low and this will be taken in consideration in the "new greater area".	Ongoing

Interested and Affected Parties	Contact Details	Consulted	Interest/ Capacity	Notification/ Consultation	Issues raised	EAPs response to issues as mandated by the applicant	Consultation Status (consensus, dispute, ongoing, etc.)
					mine would you do about visiting the area and paying respects.		
M T Nkwana			Attended the meeting held on the 23rd of August 2016 with the Konephuti Tribal Authority		- Mr Nkwana noted that the building of a hall at the village should be a consideration for the mine.	Abel Mbule noted that this will be addressed in the revised SLP.	Ongoing
Raymond Magola			Attended the meeting held on the 23rd of August 2016 with the Konephuti Tribal Authority		- Mr Magola warned the management that people there are “selling jobs like peanuts”. He also noted that the dust problem is serious since learners at Maraoka School will be affected by Silicosis and also TB. He stressed that the community suffers under a high rate of unemployment and called on the mine to consider employment within this community.	Herman Gildenhuys responded by saying that the dust issue will be addressed in the air quality assessment where the study will look at dust, size of dust particles, and this will determine whether the dust can enter the lungs. He explained that for example, if the particle is small, that might lead to silicosis but this will be assessed. He noted that dust suppression is possible and this will form part of the recommendations in order to minimise dust problems. Abel Mbule answered that the mine management was ashamed of what transpired previously and he noted that individuals guilty of “job selling” were dismissed or arrested. He stressed that the mine management does not condone that and the mine will appoint special parties to investigate the issue. He called on the community to continually inform the mine of such cases so that it can be addressed. Abel Mbule also said that they respect all the chiefs equally and they will not discriminate against the traditional authority but this is not the forum to raise such issues. Abel Mbule noted the dust problem is noted and explained that they already improved the irrigation system at the dam which is work in progress. He stressed that people should but informed: the type of rock in the bushveld complex does not contain silica and as such there cannot be a risk of silicosis and this is why dust liberation is not done.	Ongoing

Interested and Affected Parties	Contact Details	Consulted	Interest/ Capacity	Notification/ Consultation	Issues raised	EAPs response to issues as mandated by the applicant	Consultation Status (consensus, dispute, ongoing, etc.)
Mr Mabilo			Attended the meeting held on the 23rd of August 2016 with the Konephuti Tribal Authority		- Mr Mabilo noted that the tailings dam is overflowing taking water to rivers where it is used by people and animals and it is also applied for agriculture. He said that this is dangerous and should be examined. - Mr Mabilo continued to say that, as an important point, woman selling fruit and various products at the gate have to do so under bad conditions and he called on the mine management that this be addressed. - He continued by saying that opencast type mining relies more on machinery meaning that labour opportunities are lost and he called on the mine management to provide training so that they will be employed rather than skilled workers from outside.	Abel Mbule noted that he will follow up with Exigo on the overflowing dam. Herman Gildenhuys replied by stating that one study will look at groundwater and rivers, it will make recommendations as to the averting of water pollution. He also noted that water monitoring is being done to look at water quality. On the issue of vendors Abel Mbule noted that when the mine restarts they will address alternatives but he explained that, in the interest of safety, the vendors will not be required at the gate anymore. He then referred the incident where their lives were almost lost due to an accident at the gate. Abel Mbule noted that opencast mining involves a lot of machinery and the employment opportunities will be limited but the management will go through every effort to give preference to local communities.	Ongoing
Aaron Ntebele			Attended the meeting held on the 24th of August 2016 with the Mahlokwane Tribal Authority		- Mr Ntebele asked how the community will benefit from the operations if the opencast mine is going to operate for only12 months.	Abel Mbule responded that there will not be many employment opportunities since opencast is machinery intensive. He assured the community that each opportunity that will arise on employment and procurement preferences will be given to local community. He noted that the fact that underground mining will be done while opencast mining commences is a benefit since more people could be accommodated for labour underground.	Ongoing
William Khomani			Attended the meeting held on the 24th of August 2016 with the Mahlokwane Tribal Authority		- Mr Khomani commented on the SLP and noted that their community never benefited from the SLP. He asked how the mine plan will accommodate this community and how they will benefit from the updated SLP. - Mr Khomani further noted that the	Abel Mbule replied that they are aware that this community and the other community of Kgosi Magoswane was not part of their jurisdiction in the past but recruitment for new recruits will be fair to all the communities including this one. Abel Mbule replied that this process will be facilitated by the trust that the communities will be forming.	Ongoing

Interested and Affected Parties	Contact Details	Consulted	Interest/ Capacity	Notification/ Consultation	Issues raised	EAPs response to issues as mandated by the applicant	Consultation Status (consensus, dispute, ongoing, etc.)
					mine should ensure that the newly appointed CLO is qualified and that this person is someone who has the interests of all the 6 chiefs at heart. - Mr Khomani then directed a question to Herman Gildenhuys on water issues asking how water control infrastructure implementation will prevent contaminated water infiltrating the soil and affecting underground water systems. - Mr Khomani touched on the issue of pollution and asked how the mine will control air pollution during blasting and during mining. - Mr Khomani further asked how individuals affected by cracked houses as a result of blasting, will be compensated. - Mr Khomani commented that they are not happy with the dust bucket system since it is used by Marula Mine and they are still suffering from that mine. He asked if other systems could be used.	Herman Gildenhuys responded by first noting that this meeting aims to clarify questions and issues where answers are given, but on questions that needs further investigation the consultants will return to provide answers after Specialist Studies. He explained that a storm water control dam will be built so that storm water will be directed to the dam that will be lined to avoid infiltration of the soil. He noted that storm water consultants were appointed to design the dam and make sure it is of sufficient capacity. Herman Gildenhuys further explained that the mine will recycle and reuse that water in their process to ensure that the dam water levels remain low in order to allow for sufficient capacity for storm water. He explained that part of the report is called an EMP which will direct the mine as to how they should manage any element that could pollute the water. Abel Mbule added that there is currently a number of water monitoring points and there will be such points where water is monitored in future. Herman Gildenhuys responded that water suppression will be done and the mine is busy with dust monitoring to see how much dust comes from the operation. He explained that the amount of dust emitted is measured in dust buckets and there are legal limits for those emissions. These measurements assist the mine to apply more stringent measures in terms of dust management practises if necessary. Herman Gildenhuys noted that in the Scoping Study they will look at different blasting techniques in order to minimise dust liberation. These aspects will form part of the Scoping Report after studies have been completed. Abel Mbule replied that an assessment of blasting focusing on settlements in a radius of 400m – 500m will be conducted. He noted that, should it become evident that houses cracked as a result of mining, the mine management will have a responsivity duty to fix those houses. Herman Gildenhuys responded that this dust bucket system is a proven system which is required for this kind of dust monitoring. He noted that they will investigate to see if there are other ways to monitor dust but he	

Interested and Affected Parties	Contact Details	Consulted	Interest/ Capacity	Notification/ Consultation	Issues raised	EAPs response to issues as mandated by the applicant	Consultation Status (consensus, dispute, ongoing, etc.)
						stressed that the current method is sound.	
Laurence Mafololela			Attended the meeting held on the 24th of August 2016 with the Mahlokwane Tribal Authority		- Mr Mafololela asked how the community will benefit in terms of employment opportunity numbers for opencast. - Mr Mafololela pointed to the fact that previously it was indicated that focus would be on this village in terms of employment, skills development and training. He asked of skilled people from this community will be employed.	Abel Mbule replied the numbers are not available but they are busy finalizing the scope of the opencast activities where after more information on employment will be available. He ensured that community that they will return and communicate this to them. Abel Mbule responded that as per the SLP, they will try to develop the skills of the people.	Ongoing
Kgopane (Mac?)			Attended the meeting held on the 24th of August 2016 with the Mahlokwane Tribal Authority		- Mr Kgopane asked Herman Gildenhuys who his employer is, who pays his salary and why he is at the meeting – considering the fact that Herman Gildenhuys noted that he is not employed by the mine. - Mr Kgopane noted that, “in the document” there is mention of a SIA but not an SLP. He commented that the mine is going to “extract the land” and this infringes on his rights. He said that his animals use that land and there are graves – he asked how these issues will be addressed. - Mr Kgopane pointed to the mine’s statement that no rainwater from the mine spills into the rivers where livestock drink. He asked why the mine can’t provide drinking “positions” for their livestock, before dams are built and livestock drinks that bad water and dies.	Herman Gildenhuys replied that he works for a company called Exigo and his salary is payed by this company and not by the mine. The mine appointed the company (Exigo) to do the work in an independent way. He stressed that the Scoping and EIA Reports to DMR has to be independent and he cannot work in favour of the mine if there are issues. He concluded that their Reports are compiled for the Department and the company has a reputation to uphold. Herman Gildenhuys noted the concerns and assured Mr Kgopane that the impact on livelihoods of people will be investigated and he said that this will be part of the studies that will be investigating these issues. Abel Mbule replied that graves at risk of impact were removed from the mining area and so far, no graves have been identified unless additional burials can be indicated by community members. He assured the community that the correct procedures will then be followed. Herman Gildenhuys explained that there will be infrastructure to ensure that storm water dams does not leak, ground and surface monitoring has been done at the mine and in the surrounding areas and groundwater quality will be assessed. He said that the mine will then know when there is a water problem and this will be addressed. Herman Gildenhuys confirmed that the Noise Impact Assessment will examine this where the study will look at how loud the noise will be at specific spots and how loud noise will be at nearest houses. Herman Gildenhuys reiterated that regulations and the law govern	Ongoing

Interested and Affected Parties	Contact Details	Consulted	Interest/ Capacity	Notification/ Consultation	Issues raised	EAPs response to issues as mandated by the applicant	Consultation Status (consensus, dispute, ongoing, etc.)
					- Mr Kgopane enquired about the Noise Impact Assessment and asked how the mine will control noise around households in the vicinity of the mine.	as to how loud these noises may be in areas where people stay and the Study will make reference of that they will provide feedback. Abel Mbule added that water from the mine will be recirculated and reused at the mine and streams will not be affected. He stated that, should it become evident that streams or drinking points have been affected, they will engage and for this reason they have specialists to advise on these issues.	
Triaes Magokwane			Attended the meeting held on the 24th of August 2016 with the Mahlokwane Tribal Authority		- Mr Magokwane noted that there are a lot of trees from the past in that mountain where the open pit will be. He explained that the trees are indigenous and the locals depended on them for health purposes where it is part of their culture to use the plants. He wanted to know how the mine will compensate or accommodate the communities for the loss of those trees. - Mr Magokwane pointed to the hand-out and the map and wanted to clarify the distance that mining will be to the nearest community. - Mr Magokwane commented on a response pertaining to ecology and site rehabilitation by saying that, on the aerial photo you can see white areas where the previous open pit was. He noted that this is a true reflection that the trees are not growing there and in those areas again.	Herman Gildenhuys noted that an ecological assessment will assess all the plants on the site and that study will also look at all the plant species used for medicine. Recommendations will be made for closure in terms of vegetation and it will examine whether these plant species will be able to grow back after mine closure. Abel Mbule added that the mine will need to rehabilitate the area to look like it was before mining. Abel Mbule replied that they will look at a 500m radius if the blasting assessment says this distance safe. He noted that this distance is still within the mine property even if they maintain a radius of 500m.	Ongoing
Olga Mokrerega			Attended the meeting held on the 24th of August 2016 with the Mahlokwane Tribal Authority		- Me Mokrerega commented that chrome should be stockpiled in order to provide a possible later opportunity for the community to sell the resources.		Ongoing
Hendrik Mahlokwane			Attended the meeting held on the 24th of August 2016 with the Mahlokwane Tribal Authority		- Mr Mahlokwane repeated the question about procedures for the employment of affected communities. He also commented that job selling at the mine was fraud		Ongoing

Interested and Affected Parties	Contact Details	Consulted	Interest/ Capacity	Notification/ Consultation	Issues raised	EAPs response to issues as mandated by the applicant	Consultation Status (consensus, dispute, ongoing, etc.)
Sehlaku Community			Attended the meeting held on the 25th of August 2016 with the Sehlaku Tribal Authority		- Opencast is a community dump and not for Phokathaba - They have the Trust Deed of Maandagshoek Farm and have powers referring to (Chief Isaac Kgoete) - Want equity on opencast - Agree that it was announced that Phokathaba will come back on opencast but the community is not satisfied - Opencast will employs only four people - They are talking to Richard Spoor and they will take the mine to court if needs be - They are going to make follow-up with DMR regarding an opencast - They are aware that Sakhile is busy consulting with ASA in exchange for Chrome and Platinum. - Want the Stakeholder Relations position to be taken by local person - Don't want Phokathaba to get Rights on opencast and Chrome - They will officially come and march against the General Manager - Mike promised that he will get one of the investors from Mokopane Mining Indaba to come and address the community - Some complaint of the cracked houses in the past and safety of their people - They want the initial consultants/people who came for the first consultation when the mine started - They used to collect wood and hunt in the past benefitting from the mountain.		Ongoing
Final Speaker from ex-employees			Attended the meeting held on the 25th of August 2016 with the Sehlaku Tribal Authority		- They want their money from 2012 - The working group should put their issue on top of the list as the first item to be discussed - Won't grant Phokathaba the permission to do opencast without paying them first - They are giving Phokathaba Management one month to finalize their issue	Abel Mbule provided the following responses by the mine: - Clarity was given that this is not a continuation of the meeting of the 18th August, it's about proposed opencast as announced in the previous meeting. - The first meeting was about the Introduction of Phokathaba Management and the proposed approach to the formation of structures	Ongoing

Interested and Affected Parties	Contact Details	Consulted	Interest/ Capacity	Notification/ Consultation	Issues raised	EAPs response to issues as mandated by the applicant	Consultation Status (consensus, dispute, ongoing, etc.)
					- Opencast will create poverty and they don't want it.	- If the community is not prepared to talk about an opencast, we will go back and arrange another meeting with the nominated working group to discuss about the issues raised.	
Simon Kgewete (Member of royal council)			Attended the meeting held on the 23rd of August 2016 with the Mampahlane Tribal Authority		- Mr Kgewete stated that he has two questions and he proceeded to ask if houses around the area of mining activities will be assessed. - In his second question Mr Kgewete asked what the mine will do if it is found that houses have cracked as a result of mining.	Abel Mbule replied that those houses within a radius of 500m from the opencast mine will be assessed, according to the risk assessment. When mining commences a team will be formed, which will involve management and the community and assessments will be conducted. He stated that, should houses crack and it is evident that this is due to mining; they have a responsibility to fix such houses. Herman Gildenhuys replied that, as part of the EIA there will be a blasting impact assessment and this study will look at safe distances for the opencast pit will be placed. Abel Mbule noted that he will explain house surveys before mining commences.	Ongoing
Maseru Mafatle:			Attended the meeting held on the 23rd of August 2016 with the Mampahlane Tribal Authority		- Mr Mafatle asked how many people will be employed by the opencast mine. - Mr Mafatle repeated the question of compensation to people who have been affected by cracks in their houses. - He then asked what will be done about polluted water used by cattle and humans at the rivers in the area. - Mr Mafatle asked how air pollution will be controlled in communities around the mine.	Abel Mbule said that they are looking at a detailed scope for the project but at this stage it is not clear as to how many people will be employed. He assured the community that locals will be given first preference in employment and procurement. He noted that, once the full scope is available they will communicate that to the community. AB replied that they are conducting water monitoring at the mine and they are studying water quality in boreholes and wells, as well as rivers and streams. This assists them to assess impact on rivers and streams and impact on boreholes. He noted that recommendations will be made, actions are binding to the mine and the actions will tell the mine how they should manage water in the area to ensure water is not polluted. Abel Mbule replied that an Air Quality Impact Assessment is underway and past studies have shown that in this area the wind travels from southwest to northeast - in other words it comes from the direction of "Modikwa". He noted that, in most cases this is the direction the wind is taking but are mindful of the fact that wind directions change. He repeated that studies will assist in controlling dust. He explained that, at present they have a number of dust buckets in different areas which pick up dust that comes from driving, blasting and wind. The samples are taken	Ongoing

Interested and Affected Parties	Contact Details	Consulted	Interest/ Capacity	Notification/ Consultation	Issues raised	EAPs response to issues as mandated by the applicant	Consultation Status (consensus, dispute, ongoing, etc.)
						monthly to the laboratory where the effect is analysed. He noted that the dust buckets were planted in June, the first samples have been taken to the laboratory and they will receive the results during the next week. Based on this they can assess if the dust issue is tolerable or not. Abel Mbule continued to say that sprinklers at the slimes dam operate every day and they are busy improving the system so that there is minimum dust. He assured the community that the mine will continue to work on dust suppression.	
Isaac (?)			Attended the meeting held on the 23rd of August 2016 with the Mampahlane Tribal Authority		- Isaac wanted to know how their community would benefit from the mine and he asked if chrome from the mine is for the community since the mine is for platinum	Abel Mbule replied that they don't have chrome rights but he noted that this is one of the opportunities that the mine referred to, as benefit to communities. He noted that the mine has applied for permission whereby chrome that is going to be mined from the opencast is going to fall in the same category. He noted that chrome will be stockpiled, awaiting permission.	Ongoing
Stephen Matje			Attended the meeting held on the 23rd of August 2016 with the Mampahlane Tribal Authority		- Mr Matje enquired about minutes for the previous meeting in order to get an idea of the community's position. - Mr Matje noted that small amounts of minerals will be deposited in the slimes dams and he asked how the mine will manage the slimes dam and the particles and dust in the slimes dams, since dust also contains chemicals. - He continued to ask what the mine will do with waste material from opencast operations.	AB responded that there are no minutes since it is the first time that the mine consulted the community from the EIA consultant's side. Herman Gildenhuys replied that waste material will be used to refill existing open pits i.e. as they open up new pits old pits will be filled.	Ongoing
Betty Molapo			Attended the meeting held on the 23rd of August 2016 with the Mampahlane Tribal Authority		- Me Molapo noted that their kids might be affected by asthma and she wanted to know how the mine would protect communities from the dust.	Abel Mbule noted that there are a lot of questions and concerns on dust and air quality, and he assured the community that they will look at dust and dust suppression mechanisms. He noted that the mine usually sprays areas with lots of dust with water. He continued to say that this issue will be taken seriously and medical practitioners will be involved. They will not only look at dust but also vibrations potentially worsening the situation.	Ongoing
Zodwa (?)			Attended the meeting held on		- Me Zodwa asked if opencast will	Abel Mbule replied that they have to keep the plant at capacity, and in order for them to	Ongoing

Interested and Affected Parties	Contact Details	Consulted	Interest/ Capacity	Notification/ Consultation	Issues raised	EAPs response to issues as mandated by the applicant	Consultation Status (consensus, dispute, ongoing, etc.)
			the 23rd of August 2016 with the Mampahlane Tribal Authority		run concurrently with underground mining since the planned opencast operations will only continue for 12 months.	operate at capacity production from underground and opencast mining is required. Thus, it will run concurrently even though one might commence operations before the other. He noted that opencast mining requires planning and preparation and therefore the open pit will not go into production immediately since overburden need to be removed. He continued to say that, depending on their strategy, they may consider underground mining while opencast plans are finalized.	
Stephani (?)			Attended the meeting held on the 23rd of August 2016 with the Mampahlane Tribal Authority		- Me (Ms)? Stephani wanted to know what criteria would be used to recruit members from their community, and which measures will be taken to train them. - She repeated the earlier question on what the mine will do with waste material from opencast operations. - Me Stephani appealed to the mine to consider building a hall for their queen for when weather is not good.	Abel Mbule explained that this will be finalize it with the trust but he stressed that at every opportunity locals will be considered first for employment. He noted that the mine needs to provide training as it is a law requirement. Herman Gildenhuys replied that waste material will be used to refill existing open pits i.e. as they open up new pits old pits will be filled. These areas will be rehabilitated. AB noted the appeal and said that this will be addressed in the SLP. He stated that this should not be confused with the EIA process.	Ongoing
Thabelo (?)			Attended the meeting held on the 23rd of August 2016 with the Mampahlane Tribal Authority		- Mr Thabelo asked if mining would be conducted by the mine or by contractors.	Abel Mbule answered that opencast mining will be undertaken by specialist since it is projected to be a short term project and the mine will consider outsourcing. Here, he explained that it won't make sense to employ labour permanently but retrench the workforce after 12 months. He assured the community that the mine will investigate how the community can benefit from the mine.	Ongoing
Mafadi Ralph Milane			Attended the meeting held on the 23rd of August 2016 with the Mampahlane Tribal Authority		- Mr Milane wanted to know what the mine would do in terms of vibrations and the noise pollution since explosives will be noisy. - Mr Milane requested Abel Mbule to	Herman Gildenhuys answered that a Noise Impact Assessment will be conducted and this study will provide findings and feedback. He noted that the latest and safest technology on the market will be investigated to minimise flying rocks and noise impact. He noted that chemicals can crack rock – avoiding blasting and this is an option to investigate.	Ongoing

Interested and Affected Parties	Contact Details	Consulted	Interest/ Capacity	Notification/ Consultation	Issues raised	EAPs response to issues as mandated by the applicant	Consultation Status (consensus, dispute, ongoing, etc.)
					develop community companies, if they are present. Here, Mr Milane noted that the community could assist in system utilise blasting and the community can feed the mine with info on explosives companies.	AB commented that a Risk Assessment will look at addit collapse and he noted that the chances of addits collapsing are a minimum.	
Stephen Matje			Attended the meeting held on the 23rd of August 2016 with the Mampahlane Tribal Authority		• In terms of dust control mechanisms, Mr Matje asked whether a company has been appointed for assessing the slimes dam. • Mr Matje then raised a few questions and proposed recommendations. He stressed a water problem and asked if there would be purified water when the mine opened. He requested that water be purified for the community when water is purified for use at the mine. He called on the mine management to apply for a chrome licence for the community with the option of possible production infrastructure. When PGM's extracted, in the meantime the community can benefit from chrome.	Abel Mbule answered that the care and maintenance team is controlling dust. Abel Mbule replied that the mine does not discard water since water is recycled; it is circulated underground and then pumped to the surface. He noted that purified water provided to the community complies with the necessary standards, this is also the water used at the mine. He noted that the issue of supplying water to the community will be further addressed in the SLP.	Ongoing
Juda (?)			Attended the meeting held on the 23rd of August 2016 with the Mampahlane Tribal Authority		• Mr Juda noted that he has experience of opencast mining and it is his wish to see locals used as drivers at opencast	Abel Mbule replied that the trust will be informed of required skills when those opportunities arise. Interested initials can then come forward and submit qualifications where after tests will be conducted in order to ensure fully trained and competent workers.	Ongoing
Ralph (?)			Attended the meeting held on the 23rd of August 2016 with the Mampahlane Tribal Authority		- Ralph clarified that one cannot operate at opencast mining without drivers licences.		Ongoing
Frank Morarwa			Attended the meeting held on the 23rd of August 2016 with the Mampahlane Tribal Authority		- Mr Morarwa wanted to know what the mine would do to assist in training the operators.	Abel Mbule responded that this would be addressed in the reviewed SLP which would include training. He stressed that the mine can't employ everyone but they will look into developing skills so community members can also be employed by neighbouring mines. He stated that previously retrenched workers would be recalled first before going to new recruits.	Ongoing
Pirates Nkabela			Attended the meeting held on the 23rd of August 2016 with the Mampahlane Tribal Authority		- Mr Nkabela expressed concern that the project will be rejected by residents around the mine since the operations will be close to communities.	Abel Mbule noted that he does not foresee a rejection of the opencast project. He reiterated that, by law, the mine is allowed to blast 500m as a safe distance but the mine needs to follow all procedures to inform communities that such activities are going to	Ongoing

Interested and Affected Parties	Contact Details	Consulted	Interest/ Capacity	Notification/ Consultation	Issues raised	EAPs response to issues as mandated by the applicant	Consultation Status (consensus, dispute, ongoing, etc.)
					- Mr Nkabela asked if people will be left “on the high and dry” or will opencast mining be a long operation. - Mr Nkabela indicated that he was pleased to hear that underground and opencast mining will run concurrently. He called on the mine to facilitate the opening of the trust. He asked the mine management to stick to their promises since there was a tendency among mines in the area to mislead communities about ore extraction. He noted that this could be the first mine to operate truthfully among many other mines in the area. He concluded by saying that the trust will be able to acquire 9% as discussed and this should be applied to build community shares.	take place. Here, possible impacts need to be communicated to communities and their participation in the process is crucial. Abel Mbule responded that the resources at the 2 hills have about 5 years of mining remaining and they would like to proceed non-stop until the LOM has been reached. He noted that this is also the reason why they want to approach the project correctly in terms of mining and social development and engagement of the community. He noted that the mine is in talks with Modikwa Mine to acquire additional land which will extend the LOM to 8 years.	
Mampahlane community			Attended the meeting held on the 23rd of August 2016 with the Mampahlane Tribal Authority		• It was asked what the community will gain as at other opencast operations there is a 50/50 split in resource allocation. It was noted that chrome is for the community, as at other mines such as Maroele mine. • A lady from the community lastly requested that the mine assist in the construction of a new road to the hospital since the existing road was in a bad condition.	Abel Mbule replied that the chrome licence is the problem and chrome will fall in the agreement that is in transit. He noted that they have the mining right for platinum. He reiterated that opencast mining is not a new mine but just an extension for more production and as such, it falls under the scope of the current mining right.	Ongoing
Maandagshoek Banareng Committee of Communities	Maandagshoek	Yes	Committee	On 8 December 2016 the committee submitted a letter to Exigo via email in which they objected to the project. On 27 February 2017 the committee however submitted another letter via email to Exigo in which they withdrew their original letter.	• The objection that was originally submitted to Exigo was withdrawn. Both letters are included in Appendix 9.5 for more information.	Exigo acknowledged receipt of the letters and noted that the initial letter was withdrawn. No further comments received.	Ongoing

11. **THE ENVIRONMENTAL ATTRIBUTES ASSOCIATED WITH THE DEVELOPMENT FOOTPRINT ALTERNATIVES** (The environmental attributes described must include socio-economic, social, heritage, cultural, geographical, physical and biological aspects)

11.1. Type of environment affected by the proposed activity.

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

11.1.1. Rainfall

Smokey Hills is located on the water divide between the B71E and B41J quaternary catchments. The Water Resources of South Africa 2012 (WR2012) database indicates a mean annual precipitation (MAP) of 591 mm/a for the B71E catchment and a MAP of 598 mm/a for the B41J catchment. The WR2012 data per quaternary catchment was compiled from a number of rainfall stations per quaternary catchment and reviewed to get to a final patched rainfall dataset per rain zone (applicable to one or more quaternary catchments that are grouped based on similar rainfall micro climatic zones) that stretches from 1925 to 2010.

The Maandagshoek rainfall station 0593126W is the closest South African Weather Service (SAWS) rainfall station to the Smokey Hills mine site. It operated from October 1924 to December 1993 totalling 69 years of unpatched monthly rainfall data with 2.62% missing months, indicating a comparably complete rainfall record over the 69 years. The MAP calculated for the Maandagshoek rainfall station is 593 mm/a.

Based on the correlation between the WR2012 and Maandagshoek rainfall station MAP's, a decision was made to use the Maandagshoek 0593126W rainfall station's unpatched data for further rainfall statistical analysis and modelling.

Refer to Figure 8 below for a monthly rainfall graph for the Maandagshoek rainfall station (0593126W).

11.1.2. Evaporation

Evaporation data for the Smokey Hills mine is obtained from the quaternary catchment data in the WR2012 dataset. The mean annual evaporation (MAE) for the B71E catchment is 1650 mm/a and the MAE for the B41J catchment is 1552 mm/a.

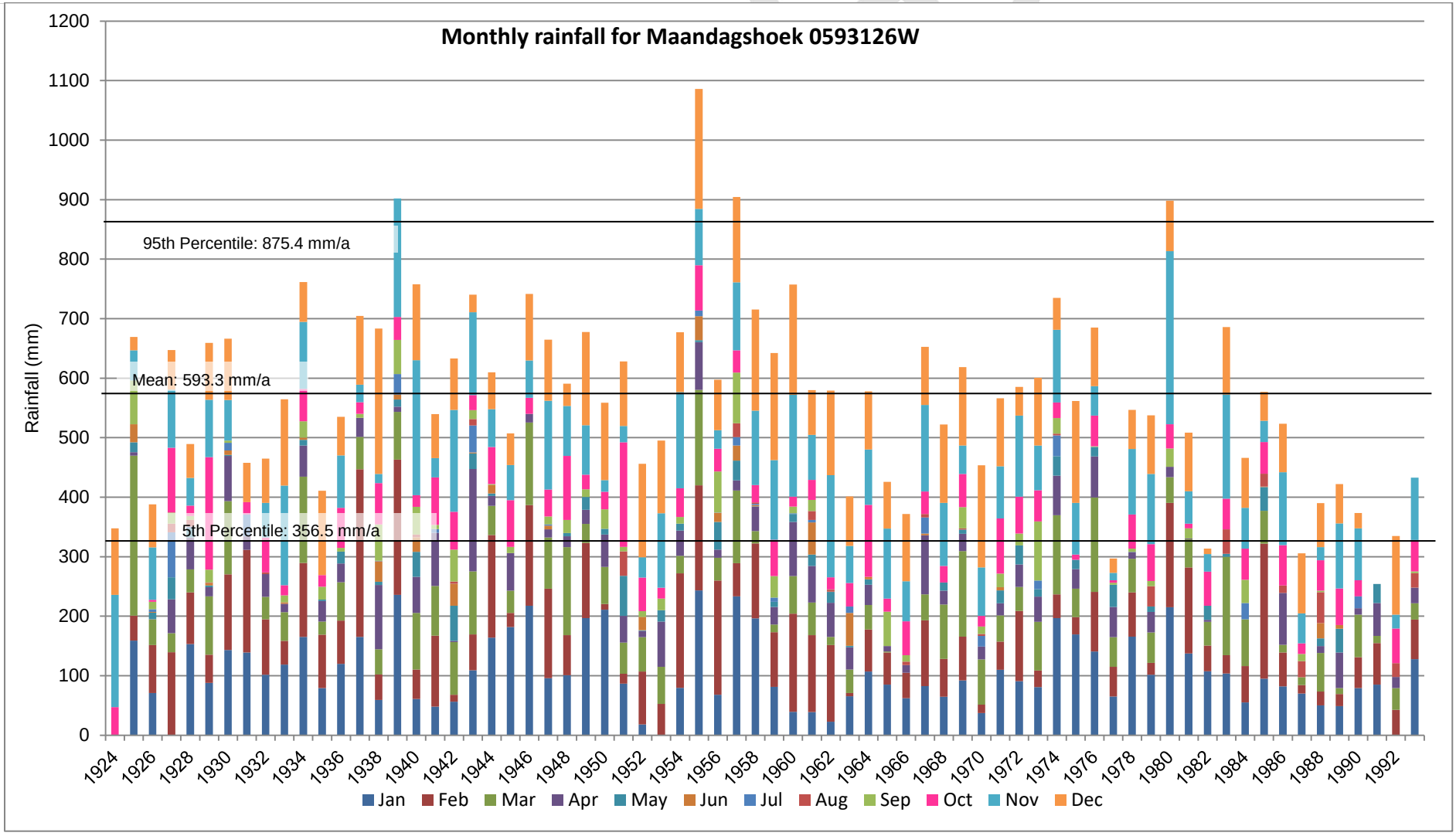

Figure 8: Monthly rainfall graph for Smokey Hills mine: Maandagshoek rainfall station 0593126W (Grobler & Vivier, 2016)

11.1.3. Temperature

A monthly-average ambient temperature trend (Figure 9), for 2013 to 2015, shows temperatures typically range between the June minimum (9.1°C) and February maximum (28.6°C), with daily-averages in the range 12.8°C (July) and 22.9°C (February) (Grobler & Enslin, 2016).

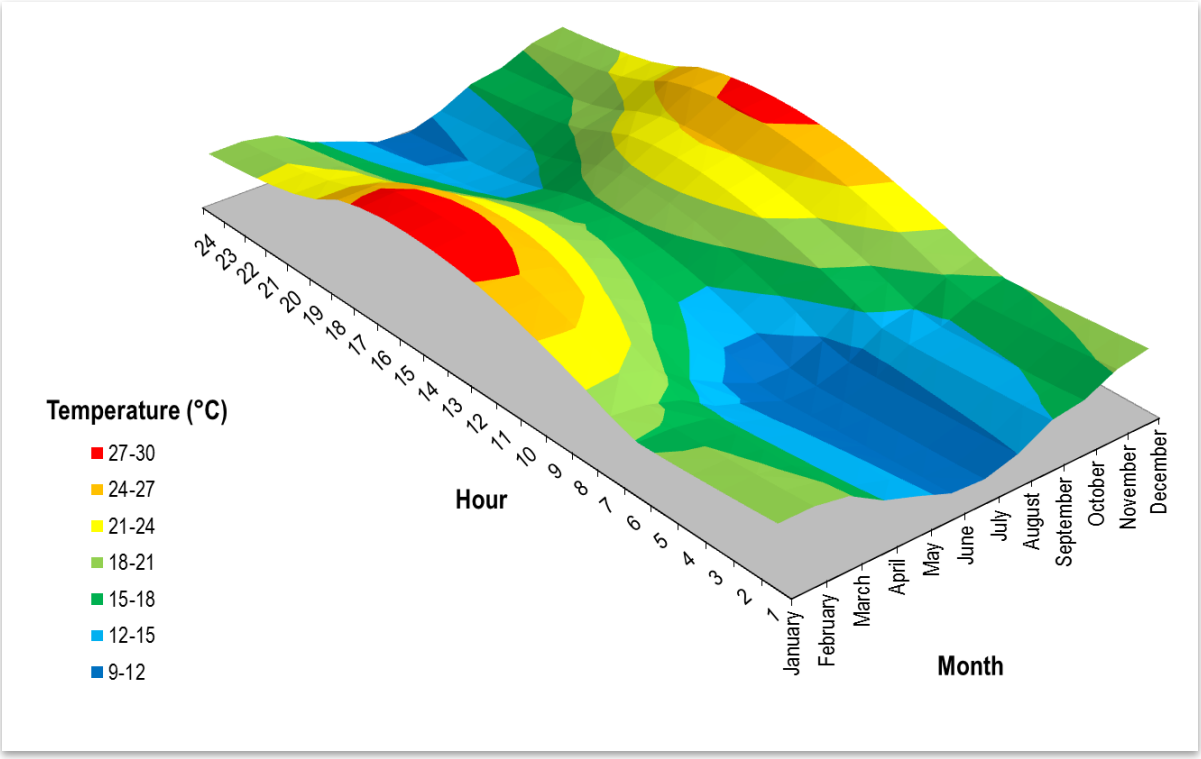

Figure 9: Diurnal temperature profile at the Smokey Hills mine for 2013 – 2015, based on MM5 modelled data (Grobler & Enslin, 2016)

11.1.4. Wind

Airshed Planning Professions used a model to determine the wind direction and speed at the mine site. CALMET ready MM5 modelled meteorological data (2013 to 2015) for a 50km by 50km area surrounding the Smokey Hills mine was processed with the CALMET model, taking into account topography and land use in the study area (Grobler & Enslin, 2016).

Surface meteorological data for a 3km by 3km area surrounding the Smokey Hills mine was extracted from the CALMET processed data and used to generate wind roses based on 16 spokes, representing the directions from which winds blew during the period (Figure 10). The colours reflected the different categories of wind speeds with the dotted circles indicating the frequency of occurrence. The flow field is dominated by winds from the easterly sector. During day-time conditions winds from the north-easterly sector are more frequent, while winds from the easterly and south-easterly sector are more common at night.

Some seasonal variation in wind direction is also evident (Figure 11) with winds from the easterly sector dominating during summer, autumn and spring. Winds in winter show the

greatest variation in direction. Summer and spring show the lowest frequency of calm conditions and the highest frequency of high wind speed events (greater than 6 m/s) (Grobler & Enslin, 2016).

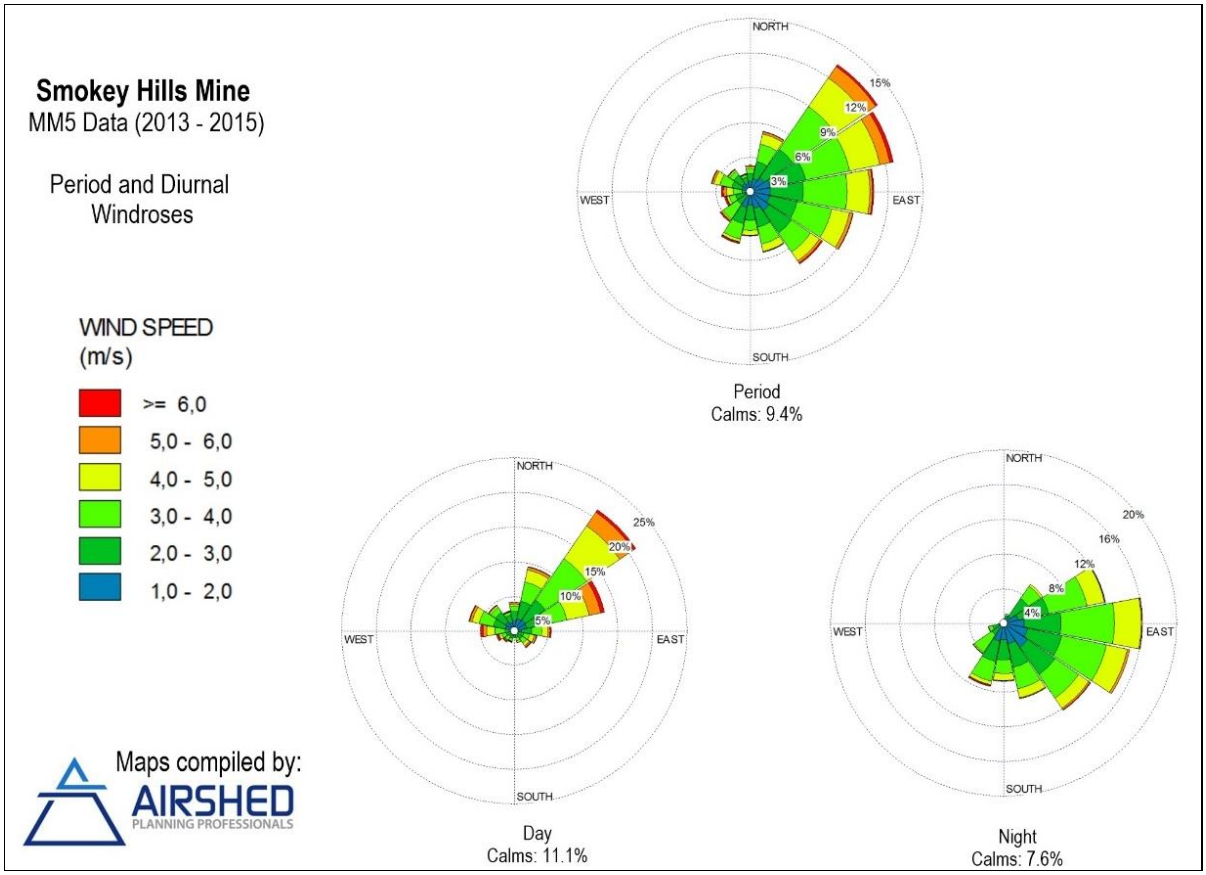

Figure 10: Period, day and night wind roses for the Smokey Hills Mine for the period 2013 – 2015, based on MM5 modelled data (Grobler & Enslin, 2016).

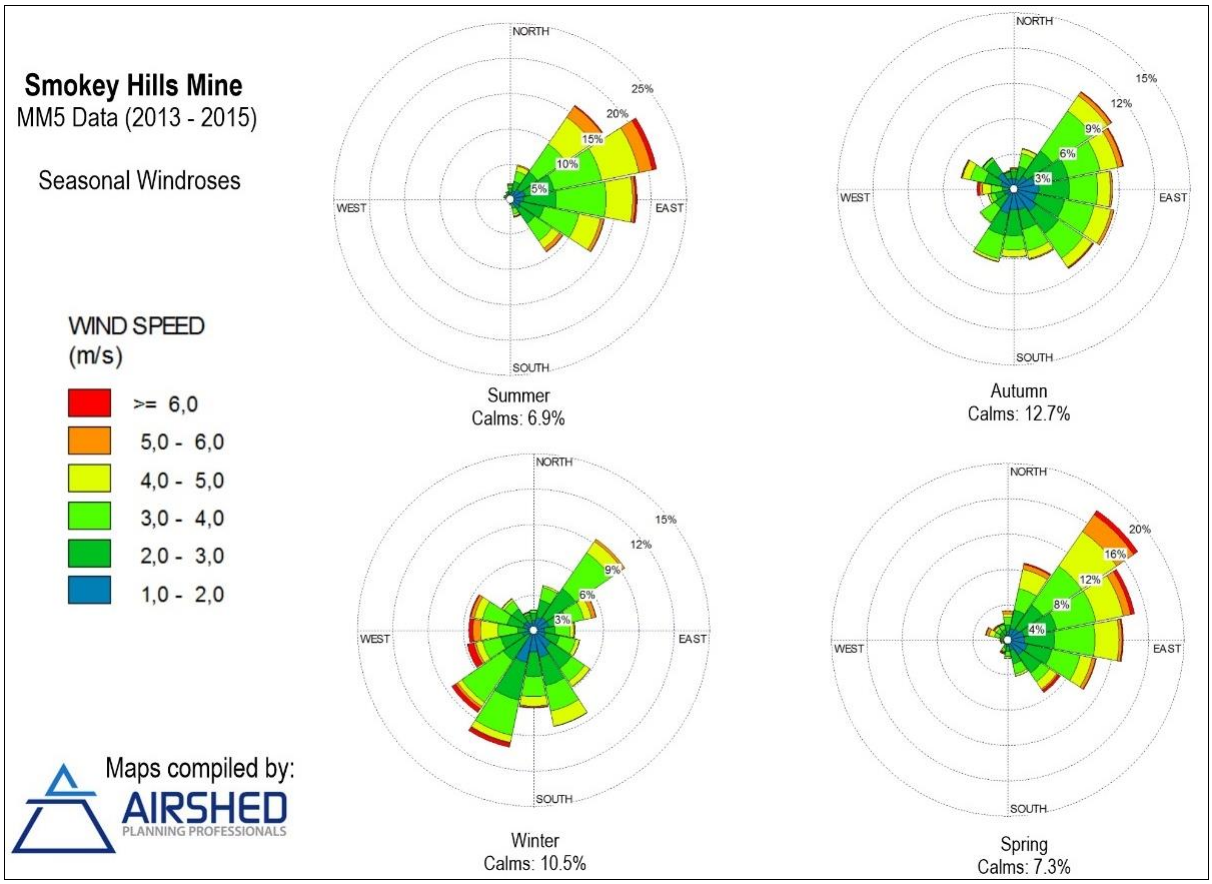

Figure 11: Seasonal wind roses for the Smokey Hills mine for the period 2013 – 2015, based on MM5 modelled data (Grobler & Enslin, 2016).

Existing sources of emissions in the study area include (Grobler & Enslin, 2016):

- Other mining activities in the area;
- Vehicle exhaust and entrainment emissions from nearby paved and unpaved roads;
- Wind erosion from open areas, (including wind erosion emission from the dormant tailings storage facility at the Smokey Hills mine);
- Small scale crop farming and livestock rearing in the study area, including emissions form land tilling operations, fertiliser and pesticide applications, harvesting, entrainment emissions form farming vehicles and wind erosion from exposed areas.
- Domestic fuel burning in the communities surrounding the Smokey Hills mine.
- Biomass burning particularly veld fires which may represent significant seasonal sources of combustion emissions.

11.2. Topography

The project area is situated along rugged hills within a number of rural settlements in the Steelpoort Valley. The terrain consists predominantly of mountainous areas with flatter parcels of developable land on the plateaus, terraces and areas adjacent to the rivers (Figure 12).

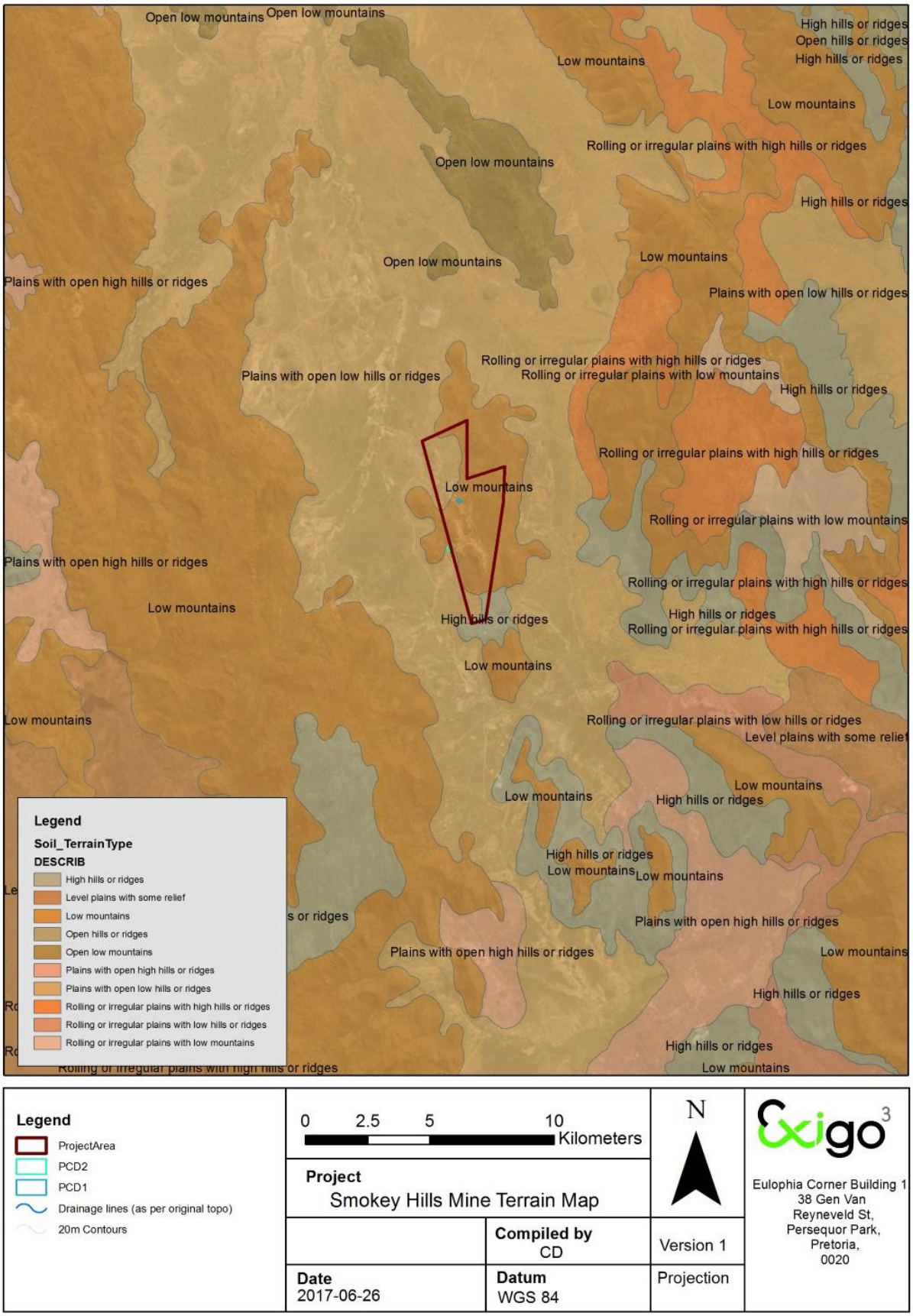

Figure 12: Terrain Type map

11.1. Geology

Smokey Hills Mine is situated in the hills of the Eastern Limb of the palaeoproterozoic Bushveld Igneous Complex (BIC). The BIC is a large igneous province thought to have formed from magmatism over a short time period of less than 10 million (Ma) years. The Rustenberg layered suite (RLS) which form part of the BIC is divided into six litho-stratigraphic horizons which include: the Marginal zone, the Lower Zone, the Lower Critical Zone, the Upper Critical Zone, Main Zone and the Upper Zone. The Smokey Hills operation occurs with the Upper Critical Zone. The principle rock types in this zone are norites, pyroxenite, anorthosites, chromitites, hazrburgites.

The critical zone comprises three groups of chromitite reefs: the Upper Group (UG); the middle group (MG) and the Lower Group (LG). The UG chromitite reefs are the major source of platinum group minerals (PGM) within the chromitite reefs of the BIC; while the LG and MG reefs are exploited for their chromium content.

The Upper chromitite group (UG) consists of four cyclic units (UG1, UG2, UG3 and UG3A) with the chromitite layers generally forming the base of each cycle with overlying melanorite to leuconorite and "stringer" leader chromitite layers and anorthosite marker units. Within the Upper Group, the UG2 reef is the major economic PGM source. The stratigraphy of the site is detailed in Figure 13.

The mining program targets the UG2 reef which outcrops on the two adjacent hills of the project area. Some 6 km of mapped UG2 PGM reef outcrop along these hills which rise some 400 m from the Steelpoort valley below. The lithology dips in a westerly direction at 10° to 15°.

The country rock are intruded by NNE-trending dykes, some of which cut through the mine area. The geophysical surveys conducted between 2006 and 2011 indicate a north-northeast striking sub-vertical dyke beneath the tailings facility and drilling results revealed that the structure is likely to be a dolerite dyke.

Within the project area the UG2 has an average thickness and grade of 0.62 m at 8.65 g/t 4E PGM. The principle ore mineralogy of the UG2 is 60-90% chromite with interstitial orthopyroxene and plagioclase. Base metal sulphide minerals occur in trace quantities and include chalcopyrite, pentlandite, pyrite and pyrhhotite. The PGE minerals occur predominantly as sulphides particularly laurite, cooperate, Pt-Rh-Cu-Ir sulphide, braghgite, Pt-Pb-Cu sulphide and rarely vyotskite. It is typically found that the PGE minerals are associated with the base metal sulphides.

The stratigraphy of the geological units mapped during exploration as provided by the mine is depicted below in Figure 19. The regional geology of the catchment along with the boreholes drilled for monitoring and sub-surface characterisation purposes are depicted in Figure 14.

SMOKEY HILLS PLATINUM PROJECT - EASTERN BUSHVELD
STRATIGRAPHIC LOGGING CODES & TERMINOLOGY
UG2 Reef Succession

PLATINUM AUSTRALIA SA

Column	Hw / Fw layer	Ave. thickness (m)	Logging Code	Lithology / Rock type	Stratigraphic Marker and Ave. Thickness
	MR Footwall 5	>150	MR 5	Norite	
	MR Footwall 6	6.50	MF6	Pyroxene anorthosite	
	MR Footwall 7	2.00	MF7	Poikilitic pyroxene anorthosite - mottled	
	MR Footwall 8 Cr	2.00	MF8	Varitextured pyroxene anorthosite - mottled and spotted Chromitite stringer commonly at base	
	UG2 Hangingwall 6	4.50	UH6	Poikilitic Feldspathic pyroxenite / Harzburgite	
	UG3B	0.12	UG3B	Chromitite (Usually banded with narrow waste zones)	*UG3B Reef (12cm)*
	UG2 Hangingwall 5	0.30	UH5	Feldspathic pyroxenite / Harzburgite	
	UG3A	0.12	UG3A	Chromitite - Massive	*UG3A Reef (12cm)*
	UG2 Hangingwall 4	5.50	UH4	Poikilitic Feldspathic pyroxenite	
	UG3	0.25	UG3	Chromitite - Massive (UG3IW - Anorthosite internal waste)	*UG3 Reef (25cm)*
	UG2 Hangingwall 3	0.60	UH3	Poikilitic pyroxene anorthosite (Mottled)	
	UG2 Hangingwall 2	4.80	UH2	Feldspathic pyroxenite / Gabbronorite	
	UG2 Hangingwall 1	6.30	UH1B	Feldspathic pyroxenite / Melanorite (F-gr)	
	Hw Anorthosite Marker		HAM	Anorthosite (Sometimes a zone)	*HAM (37cm)*
	UG2 hanging wall 1		UH1B	Feldspathic pyroxenite / Melanorite (F-gr)	
	Anorthosite Marker		LPP	Anorthosite (Occassional Cr stringers on contact)	*LPP (3cm)*
	UG2 Hangingwall 1	1.25	UH1A	Poikilitic Feldspathic pyroxenite (M-gr)	
	Leader 4		L4	Chromitite	*UG2 - Cr Leader 4 (0.2cm)*
	Leader 3		L3	Chromitite (Cr stringers - zone of)	*UG2 - Cr Leader 3 (9cm)*
	Leader 2		L2	Chromitite (2 thin, closely spaced stringers)	*UG2 - Cr Leader 2 (0.2cm and 0.3cm)*
	Leader 1		L1	Chromitite	*UG2 - Cr Leader 1 (1.5cm)*
	UG2 Hangingwall 1		UH1A	Poikilitic Feldspathic pyroxenite (M-gr)	
	UG2	0.58	UG2	Chromitite (UG2W1 - UG2W3 - Internal waste zones)	*UG2 (58cm)*
	UG2 Footwall 1	0.90	UF1	Pegmatoidal feldspathic pyroxenite / Harzburgite	
	Footwall Stringer 1		FS1	Chromitite	*FS1 Cr Stringer (2cm)*
	Footwall Stringer 2		FS2	Chromitite	*FS2 Cr Stringer (2cm)*
	UG2 Footwall 2	6.00	UF2	Poikilitic Feldspathic pyroxenite (M to c-gr)	
	Stringer 1		S1	Chromitite (base of UF2)	*Cr stringer 1 (0.2cm)*
	UG2 Footwall 3	1.55	UF3	Poikilitic pyroxene anorthosite (Mottled)	
	Stringer 2		S2	Chromitite	*Cr stringer 2 (0.3cm)*
	Stringer 3		S3	Chromitite	*Cr stringer 3 (2cm)*
	Stringer 4		S4	Chromitite	*Cr Stringer 4 (0.8cm)*
	UG2 Footwall 4	0.55	UF4	Pyroxene anorthosite	
	UG2 Footwall 5	>100	UF5	Norite	

Note: Average Merensky Reef to UG2 Reef separation is >300m
Average Merensky Footwall 6 (MF6) to UG2 Footwall 4 (UF4) is Approx. 45m (Generally drilled at Smokey Hills)

	Pothole	Variable	PU	Pothole (Original stratigraphic units not identifiable)	Can Occur anywhere

INTRUSIVE

		Variable	FPEG	Feldspathic Pegmatoidal Intrusive - Magnetite	Can occur anywhere
		Variable	MPEG	Mafic Pegmatoidal Intrusive - Magnetite	Can occur anywhere
		Variable	Dol	Dolerite	Can occur anywhere

Figure 13: Stratigraphic log and geological succession found at the Smokey Hills mine (Source: Platinum Australia)

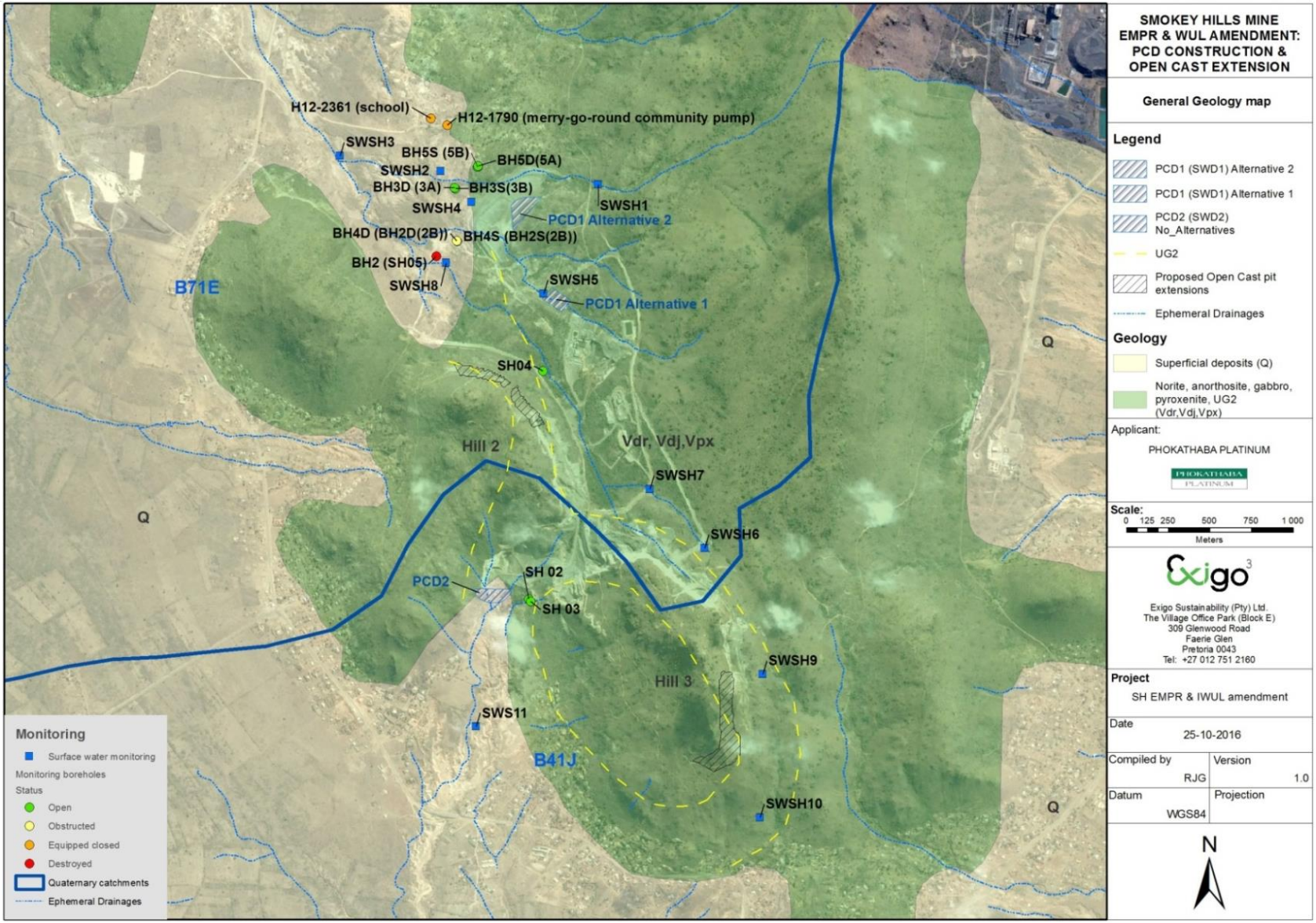

Figure 14: General geology of the Smokey Hills mine and surrounding area

11.2. Land types and Agricultural Potential

Geology is directly related to soil types and plant communities that may occur in a specific area (Van Rooyen & Theron, 1996). A Land type unit is a unique combination of soil pattern, terrain and macroclimate, the classification of which is used to determine the potential agricultural value of soils in an area. The land type unit represented within the study area include the Ea88, Ib131 and Ic154 land types (Land Type Survey Staff, 1987) (ENPAT, 2001). The land type, geology and associated soil types is presented in Table 6 below as classified by the Environmental Potential Atlas, South Africa (ENPAT, 2000).

Table 6: Land types, geology and dominant soil types of the proposed development site

Landtype	Soils	Geology
Ea88	One or more of: vertic, melanic, red structured diagnostic horizons, undifferentiated	Norite, pyroxenite and anorthosite of the Dwarsrivier Subsuite; gabbro and norite of the Dsjate Subsuite; Bushveld Complex.
Ib131	Miscellaneous land classes, rocky areas with miscellaneous soils	Gabbro, norite, anorthosite, pyroxenite, bronzitite and harzburgite of the Rustenburg Layered Suite, Bushveld Complex.
Ic154	Miscellaneous land classes, very rocky with little or no soils	Rustenburg Layered Suite; gabbro and norite of the Dsjate Subsuite and norite, pyroxenite and anorthosite of the Dwarsrivier Subsuite. Also granodiorite.

The plains within this land type are deemed to be covered predominantly by red-yellow apedal soils, with highly localized pockets of red-coloured, weakly structured clayey soils, and highly localized pockets of moderately structured clayey soils. The mountainous region is dominated by shallow, poorly developed soils and the substrate is often completely dominated by bedrock.

11.2.1. Soil Potential

A Soils, Agricultural Potential and Land Capability Assessment by Dr Buks Henning classified the soils at the proposed development site into broad classes according to the dominant soil form and family as follows (Henning, 2016a):

1. Very shallow exposed bedrock outcrops / Shallow Mispah soil form occurring throughout the study area on the undulating plains and ridges;
2. Shallow, gravelly soils of the Glenrosa / Hutton soil form along the plateaus and slightly undulating terrain of the study area;
3. Black clayey / alluvial soils of the Oakleaf / Rensburg soil forms associated with drainage channels and valley-bottom wetlands;
4. Degraded areas where the topsoil has been disturbed and often removed (old mining areas / haul roads) (*not described in the section below under soil forms*)

The geological formations and vegetation patterns showed a strong correlation to the major soil units mapped in the study area. The location of the soil forms in the landscape is presented in Figure 15. As mentioned, the evaporation dam will be situated within an old open pit and is situated on the “disturbed topsoil / mining areas” soil form.

Figure 15: Soil form map for the PCD 1 (Henning, 2016a).

Figure 16: Soil form map for the PCD 2 (Henning, 2016a).

A detailed description of each soil form is provided in the sections below (Henning, 2016a):

1. **Shallow, rocky soils of the Glenrosa or Mispah soil form associated with outcrops and ridges**

   Binominal Classification S.A.: Mispah / Glenrosa / bedrock soil form

   Description: The soils are generally shallow and derived from dolomite or quartzite ridges in the project area. All three these soil forms can be categorised in the international classification group of lithic soil forms. In lithic soil forms the solum is dominated by rock or saprolite (weathered rock). These soils have sandy to sandyloam texture, while topsoil structure is apedal and the profiles are very shallow. Exposed rocks and boulders is spread on the soil surface throughout the area.

   The soil in this area is often weakly structured, sandy to loamy and forms a mosaic of shallow Glenrosa soils and very shallow rocky soils (Mispah soil form), with the outrops mostly consisting of bedrock. The Mispah and Glenrosa soils found on this section of the site are widespread and shallow in depth, although it has a medium clay content.

   Landscape: Rocky ridges / undulating slopes

   Depth: 50-200mm

   Texture: Sandy to sandy loam soils

   Average Clay Content: 8-15%

   Agricultural Potential: Low potential soils, due to the shallow nature of the soils and sloping terrain, making these areas are not suitable for crop cultivation under arable conditions. The orthic A-horizon of the lithic soil group is unsuitable for annual cropping or forage plants (poor rooting medium since the low total available moisture causes the soil to be drought prone). These topsoils are not ideal for rehabilitation purposes for they are too shallow and/or too rocky to strip. Topsoil stripping and stockpiling of the “shallow” soils should only be attempted where the surface is not too rocky.

   Land capability: The grazing potential of these areas is moderate-low. The most suitable and optimal utilization of the area would be grazing by small livestock or game species.

2. **Shallow / medium depth red-yellow apedal soils of the Glenrosa / Hutton Soil Forms**

   Binominal Classification S.A.: Hutton soil form; Glenrosa soil form

   Description: The Hutton soils found on the site occur in pockets throughout the study area on plateaus and slightly undulating plains. The shallow Hutton soil forms are especially dominant in the southern and western section of the study area where the underlying bedrock is dolomite or chert. The Hutton soil form on site varies from shallow to deeper and has a medium to high clay content. The relatively high magnesium and iron content of the parent rocks from which these soils are derived, impart the strong red colours noted. Where it becomes very shallow the soil are classified as Glenrosa soil form.

Landscape: Plains / Plateaus

Depth of soil forms: 100-400 (Glenrosa, Hutton)

Texture: Sandyloam

Vegetation: Pristine grassland / woodland associated with plateaus / undulating plains

Average Clay Content: 10-15% (Hutton); 6-15 (Glenrosa)

Agricultural Potential: Moderate potential soils depending on soil depth and size of land available for sustainable arable agriculture. Soils vary from shallow and sandy in some areas (Glenrosa, Hutton soil form) to deeper with a higher clay content (Hutton soil form). The red apedal Hutton soils with a higher clay content in the topsoil has a high water holding capacity. Under the climatic conditions these soils would however not sustain arable crop production. Considering that the amount of land that is needed to economically sustain arable agriculture, the soil type described above cannot be considered as viable for crop production. The many old cultivated fields confirm that crop cultivation over the longer term is not a financially viable option under the prevailing climatic conditions.

Land capability: Livestock and / or game grazing are viable due to the slightly higher nutrient and organic content of the topsoil in grassland areas that support a mixture of palatable and unpalatable species.

3. **Black or dark grey clayey Soils associated with the drainage channels and floodplains of the Oakleaf, Rensburg and Valsrivier soil forms**

Binominal Classification S.A.: Oakleaf, Rensburg and Valsrivier soil forms

Description: The soils are generally dark grey to black in the topsoil horizons, and high in transported clays, and show pronounced mottling on gleyed backgrounds in the subsoils. These soils occur within the zone of groundwater influence. The soils are alluvial and are deep (>1,2m) with an orthic A and neocutanic B with signs of wetness in the horisons. Brown A horizon and red-brown B horizon. The soils are slightly sensitive to erosion. The subsoil is more sensitive to erosion and should preferably not be exposed.

Landscape: Bottomlands (drainage channel and floodplains)

Depth: >1200mm

Texture: Sandyclay to Sandyclayloam

Average Clay Content: 10-30%

Agricultural Potential: Zero potential soils, due to the soil wetness these areas are not suitable for crop cultivation under arable conditions.

Land capability: The grazing potential of these low-lying areas is high due to the palatable grasses growing throughout the year on these soils. The only limiting factor may be that livestock movement is limited during the wet season when the clay expands,

causing livestock to get stuck in the muddy conditions. Soils are very sensitive and prone to erosion. A specific strategy is needed to prevent damage to these soils considering that overgrazing and trampling has already caused some degradation of the floodplains.

11.2.2. Crop production

The soils of the project site vary from being shallow and rocky in the ridges to sandy on the surrounding plains, with isolated areas where deeper, more fertile soils occur associated with the plains and valleys of the project site.

The typical landscape of the project site is dominated by shallow, rocky soils associated with rocky ridges or very sandy / gravelly soils associated with plateaus, ridges and footslopes. These soils have a low clay content and water holding capacity, and in combination with the climatic conditions render this section of the proposed development site unfavourable for effective crop production which could result from high moisture demands by planted crops.

The isolated pockets of ravines have shallow sandy-clay or clay soils that are seasonally flooded or have a perched water table. These areas are unsuitable for crop cultivation.

The climatic conditions in combination with the shallow nature of the soils render the study area unfavourable for effective crop production which could result from high moisture demands by planted crops. The study area is also expected to receive an annual total rainfall of about 400 mm which is relatively low and highly variable. In addition, the farm is considered to be located in an area which is marginal for rain-fed arable crop production. Economically viable farming is thus restrictive to irrigated cropping due the high risk that could be associated with dry-land farming. Higher day temperatures in summer months may hamper soil moisture storage for crop use. At present no irrigation or functional centre pivots occur on the property.

11.2.3. Livestock production / wildlife grazing

The natural vegetation in the study area has a grazing capacity that varies from low (shallow, rocky or sandy soils) to medium (seasonally wet soils, deeper loamy soils). The different sections of the study area can support grazing according to the soil nutrient content as follows:

- The shallow, rocky soils associated with the slopes of outcrops has low quality grazing and at present game species utilize these areas, especially during the early summer months (September to December) when the grasses resprout in burned areas.
- The deep sandy and gravelly soils associated with the footslopes, valley floors and plateaus has low quality grazing with limited potential for livestock farming. These areas are however suitable grazing for specialized grazers such as sable antelope.
- The red-yellow apedal soils associated with the study area has a medium potential for livestock grazing due to the slightly higher nutrient content of the soil

supporting a mixture of palatable and unpalatable grasses. Grazing value decreases as the season changes from summer to winter though, with the lowest grazing potential available to livestock at the end of the season.

- The seasonally wet soils of the study area support palatable grass species and these areas have a medium suitability for livestock or game grazing. These soils have a good water holding capacity and grass species that grow in these areas vary from having a medium to high palatability depending on the seasonal changes.

11.3. Biodiversity

An Ecological Impact Assessment study was undertaken by Dr. Buks Henning from Exigo Sustainability. The sections below provide an overview of the biodiversity baseline of the mining area. The project area lies within the Savanna Biome. The Savanna Biome is the largest biome in Southern Africa. It is characterized by a grassy ground layer and a distinct upper layer of woody plants (trees and shrubs). The environmental factors delimiting the biome are complex and include altitude, rainfall, geology and soil types, with rainfall being the major delimiting factor. Fire and grazing also keep the grassy layer dominant (Henning, 2016b).

11.3.1. Vegetation

11.3.1.1. Vegetation Types

The most recent classification of the area by Mucina & Rutherford shows that the proposed development site is classified as Sekhukhune Mountain Bushveld with small section representative of the Sekhukune Plains Bushveld (Figure 21). The Sekhukune Mountain Bushveld has a 'Least Threatened' conservation status with 0.4% conserved and nearly 15% transformed, while the Sekhukune Plains Bushveld has a vulnerable conservation status, with 2% statutorily conserved and some 25% that has been transformed. Transformation is mainly through dryland subsistence cultivation and urban build up.

The vegetation structure of the Sekhukune Mountain Bushveld varies from open to dense woody layer, with associated woody and herbaceous shrubs and closed to open grass layer. The landscape topography is mainly moderate to steep slopes on mountainsides and sometimes deeply incised valleys. Flat terrain occurs dispersed in between the sloping terrain.

The landscape features of the Sekhukhune Plains Bushveld vegetation type is mainly semi-arid plains and open valleys between chains of hills and small mountains running parallel to the escarpment. The vegetation structure is mainly short, open to closed thornveld with an abundance of Aloe species and other succulents. The area is often heavily exploited by man for cultivation, mining and urbanization. Both man-made and natural erosion dongas occur in areas containing clay rich in heavy metals.

11.3.1.2. Sekhukhuneland Centre of Endemism

The site forms part of the Sekhukhuneland Centre of Endemism (SCOE). The importance to evaluate the vegetation on the site as part of the Sekhukhuneland Centre of Endemism cannot be underestimated. Most of southern Africa's endemic plants are concentrated in only a few, relatively small areas, known as regions or centres of endemism. Not only do these centres hold clues to the origin and evolution of the botanical diversity within a particular area, but these are also areas that, if conserved, would safeguard the greatest number of plant species (Van Wyk & Smith, 2001). Sekhukhuneland has been identified through previous studies as one of the most important centres of endemism in the Mpumalanga and Limpopo Provinces. The centre falls within the rainfall shadow of the Drakensberg Escarpment, and it is relatively more arid than the areas to the east. The endemic plants of this area are primarily edaphic specialists that are derived from a unique ecology.

The substrate consists of heavy soils derived from the norite, pyroxenite and anorthosite formations that predominate over the region. Endemics are both herbaceous and woody with endemism high in the Anacardiaceae, Euphorbiaceae, Liliaceae and Lamiaceae (Van Wyk & Smith, 2001). The shallow, rocky areas of the development site can be considered especially sensitive as part of the centre of endemism, and will almost certainly show similar vegetation patterns to the endemic regions, especially since the vegetation is still in a natural state. Other important attributes of this region's flora are summarized in Table 7 below:

Table 7: Attributes of the Sekhukhuneland Centre of Plant Endemism

Centre of Endemism Size:	5449.4km2
Total Number of Species / Taxa:	± 2200
Endemic / Near endemic taxa:	>100
Rate of endemism:	4.5%
Area in Limpopo Province:	2794km2
Proportion in Limpopo Province:	51.7%
Total % transformed:	28.57%

The Vegetation Types of the project area are illustrated in Figure 17.

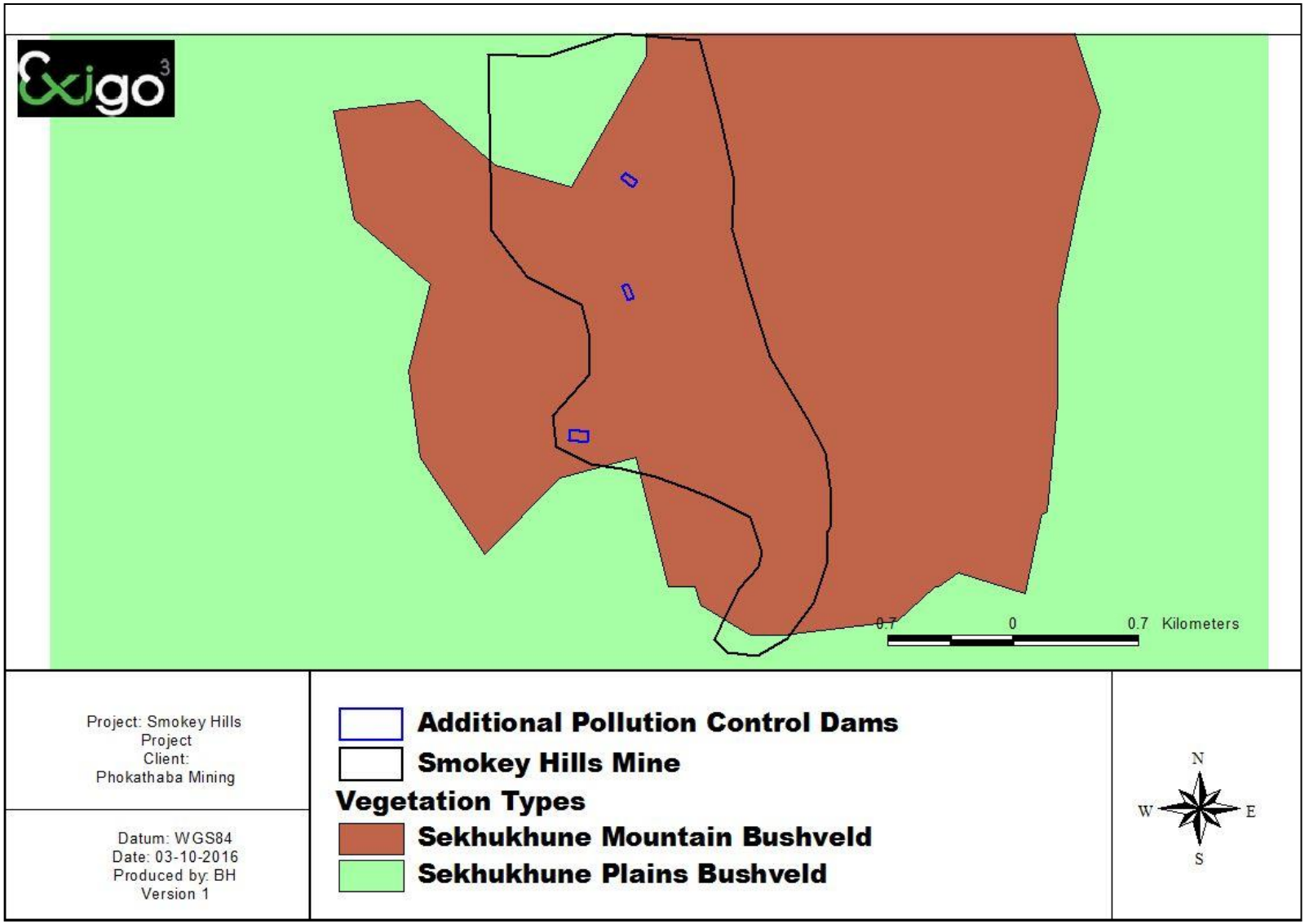

Figure 17: Vegetation Types of the project area according to the 2012 classification by Sanbi (2012) (Henning, 2016b)

11.3.1.3. Vegetation Units

The sites for the pollution control dams occur on steep mountainous terrain and low-lying valleys. The area is bisected by water courses. The farms surrounding this farm are primarily used for mining, livestock grazing, small-scale subsistence crop cultivation and rural developments.

Vegetation units were identified according to plant species composition, previous land-use, soil types and topography. The state of the vegetation of the proposed mining sites varies from being natural to completely degraded. The farms are currently zoned for mining.

The vegetation communities identified in the area are classified as physiographic physiognomic units, where physiognomic refers to the outer appearance of the vegetation, and physiographic refers to the position of the plant communities in the landscape. The physiographic-physiognomic units will be referred to as vegetation units in the following sections. These vegetation units are divided in terms of the topographical differences, previous land-use and soil differences that had the most definitive influence on the vegetation units. Each unit is described in terms of its characteristics.

The broad classification is done for each of the proposed infrastructure areas as follows:

- *Searsia keeti – Vitex obovata* shrubveld
- Degraded areas;
- Water courses and riparian woodland

The vegetation units as identified during site visits, databases and aerial imagery are indicated in Figure 18 and Figure 19 below.

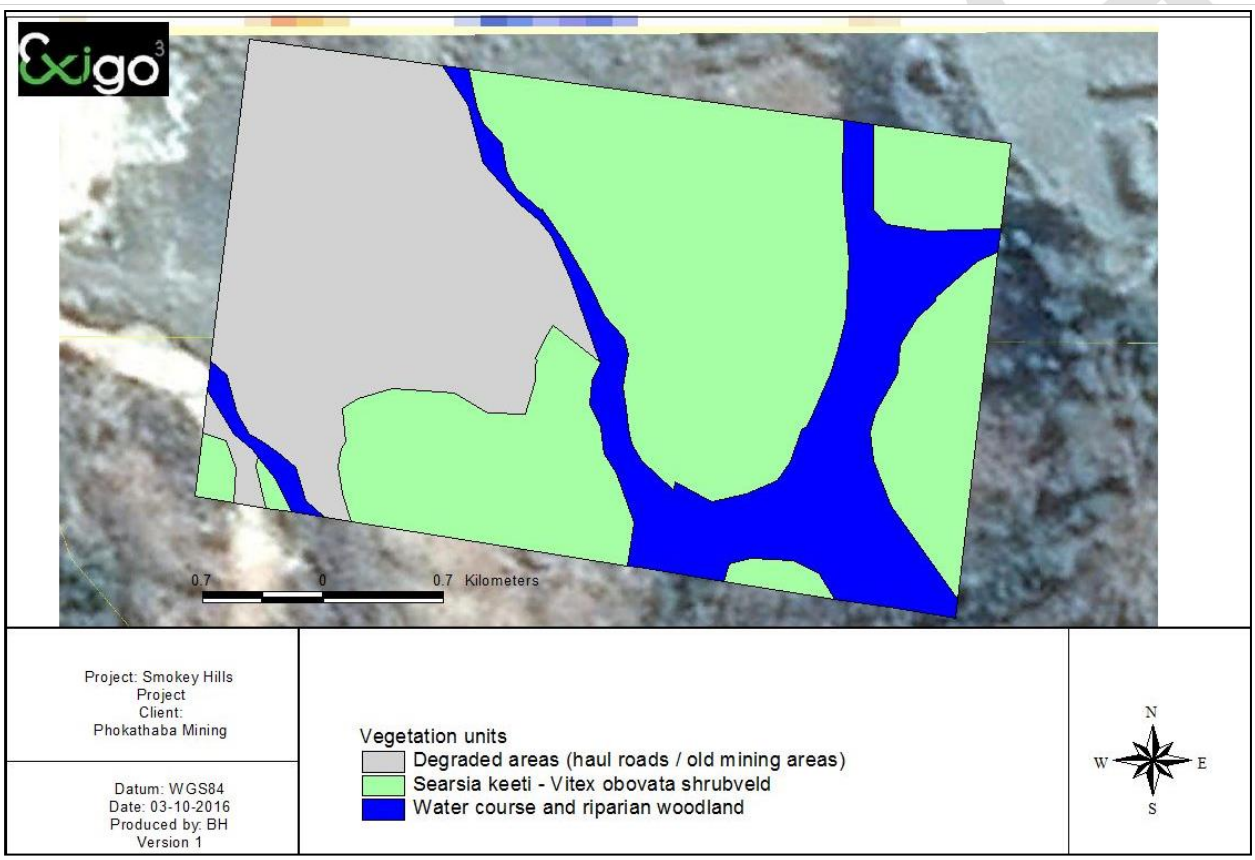

Figure 18: Vegetation Map for Pollution Control Dam 1 south of the underground mining area (Henning, 2016b)

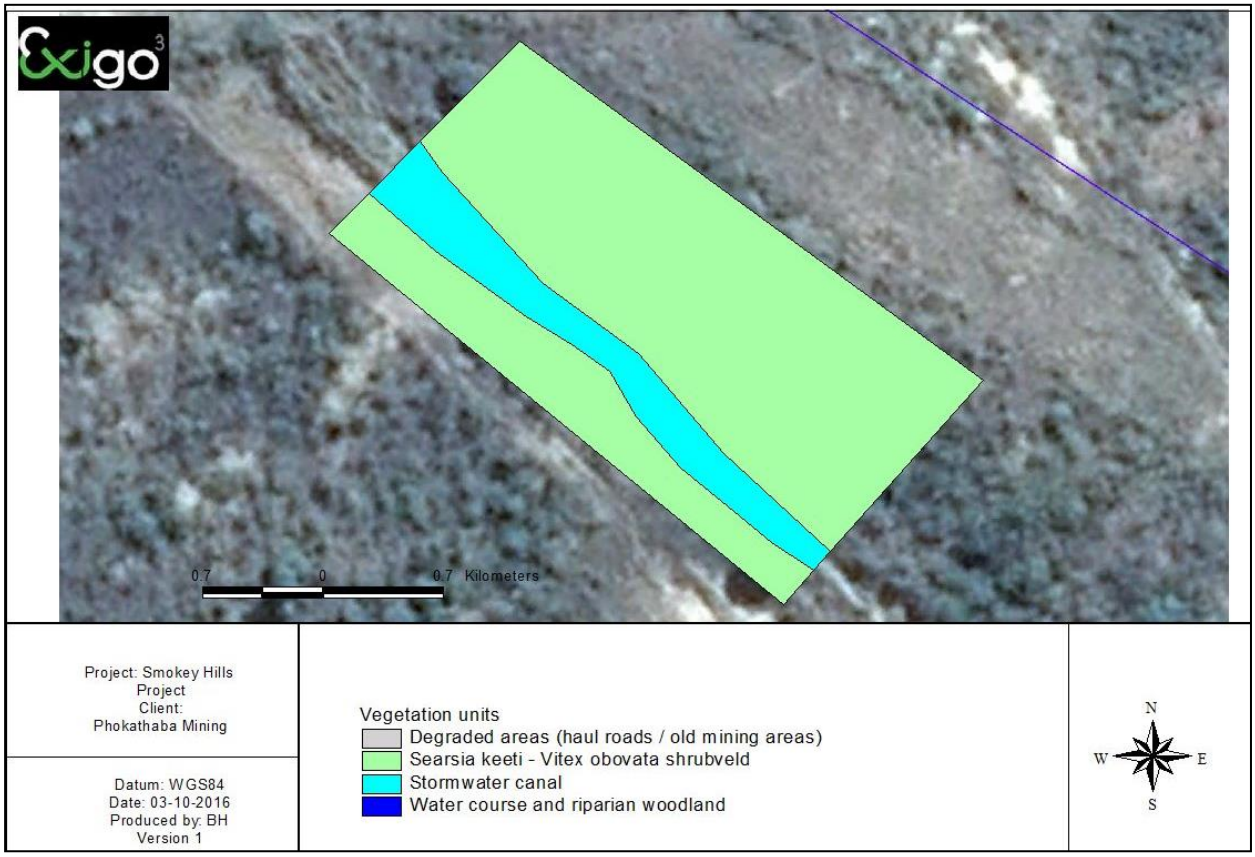

Figure 19: Vegetation Map for Pollution Control Dam 2 proposed between the plant and the tailings dam (Henning, 2016b)

11.3.1.4. Protected Tree Species

The National Forest Act (no.84 of 1998: National Forest Act, 1998) provides a list of tree species that are considered important in a South African perspective as a result of scarcity, high utilization, common value, etc. In terms of the National Forest Act of 1998, these tree species may not be cut, disturbed, damaged, destroyed and their products may not be possessed, collected, removed, transported, exported, donated, purchased or sold – except under license granted by DAFF (or a delegated authority). Obtaining relevant permits are therefore required prior to any impact on these individuals. Taking cognizance of the data obtained from the field surveys, the following tree species occur in the area:

- *Catha edulis*
- *Lydenburgia cassinoides*
- *Sclerocarya birrea*

A licence application should therefore be submitted to DAFF before any of these trees can be removed during construction.

11.3.1.5. Protected Plants (LEMA)

Plant species are also protected according to the Limpopo Environmental Management Act. According to this Act, no person may pick, import, export, transport, possess, cultivate or trade in a specimen of a specially protected or protected plant species. The Appendices to the Act provide an extensive list of species that are protected, comprising a significant component of the flora expected to occur on site. Communication with Provincial authorities indicates that a permit is required for all these species, if they are expected to be affected by the proposed project.

The following protected plant species was found on site:

- *Aloe cryptopoda;*
- *Elephantorrhiza praetermissa;*

The Ecological Impact Report to be attached to the EMPR will refer to the management of protected species.

11.3.1.6. Alien Invasive Species

According to the amended regulations (GNR. 280) of March 2001 of the Conservation of Agricultural Resources Act 1983 (Act no. 43 of 1983), it is the legal duty of the land user/landowner to control invasive alien plants occurring on the land under their control. The State has the right to clear invasive plants at the landowner's expense if the landowner refuses to remove invasive plants.

Table 8: Declared weeds and invader plants of the study area

Species	Category
Achyranthes aspera	1b
Agave sisalana	2
Argemone ochroleuca	1b
Cirsium vulgare	1b

Species	Category
Datura stramonium	1b
Opuntia species	1b
Nicotiana glauca	1b
Ricinus communis	2
Tecoma stans	1b
Xanthium strumarium	1b

11.3.2. Fauna

As a result of anthropogenic disturbance in the larger area and the limitations created by game fences, only the most tolerant generalists of the larger vertebrates still occur in the project area outside the nature reserves. Examples are grey duiker, bushbuck, steenbok and baboon. The more sensitive habitat-specialist species like honey badger, leopard, brown hyena and caracal have retreated into areas of lower disturbance such as the surrounding ridges and riparian woodland.

Four major bird habitat systems were identified within the borders of the study site, including riparian vegetation, microphyllous woodland, broadleaf woodland and degraded grassland.

Species such as the southern rock python, the black mamba, puff adder, boomslang, vine snake, spotted bush snake and several members of the green snakes (*Philothamnus spp*.) is expected to occur in the study area., although the presence of these snakes is dependent on the presence of their prey species (rodents, frogs etc.). The general habitat type for reptiles consists of open shrubveld to denser bushveld, with limited available habitat for diurnally active and sit-and-wait predators, such as terrestrial skinks and other reptiles. Arboreal species are the more prominent components of the local herpetofauna.

The amphibians appear to be poorly represented in the area. The most probable habitat to find frogs is in the seasonal pools associated with the drainage channels although this do not represent optimal habitats due to a lack of breeding habitat and water plants which will attract insect for foraging.

11.4. Wetlands

11.4.1. Wetland delineation

DWAF (2003) states that in order to classify an area as a wetland it must have one or more of the following attributes:

- Hydromorphic soils that exhibit features characteristic of prolonged saturation;
- The presence of hydrophytes (even if only infrequently);
- A shallow water table that results in saturation at or near the surface, leading to the development of anaerobic conditions in the top 50cm of the soil.

The non-perennial drainage channels on the sites for the proposed pollution control dams are considered as water courses with developed riparian woodland. In some areas, the channels form floodplains along its banks (without any wetland characteristics therefore not wetlands) as indicated in the vegetation map.

The identification of the water courses was done according to the aerial photograph and a field survey where the topography of the landscape and vegetation were used to delineate the water course or riparian zone. The more defined water courses are classified as channels. A Channel (river, including the banks) is classified as an open conduit with clearly defined margins that (i) continuously or periodically contains flowing water, or (ii) forms a connecting link between two water bodies. Dominant water sources include concentrated surface flow from upstream channels and tributaries, diffuse surface flow or interflow, and/or groundwater flow. Water moves through the system as concentrated flow and usually exits as such but can exit as diffuse surface flow because of a sudden change in gradient. Unidirectional channel-contained horizontal flow characterises the hydrodynamic nature of these units. As a result of the erosive forces associated with concentrated flow, channels characteristically have relatively obvious active channel banks.

11.4.1.1. Instream habitat / Channel Zone:

Section 1.1 (xi) of the National Water Act (1998) described “instream habitat'' as the area which includes the physical structure of a watercourse and the associated vegetation in relation to the bed of the watercourse (Photograph 12). The water courses form a channel with clearly defined banks on the edge of the channel.

11.4.1.2. Riparian zone

Riparian Habitat are described by the National Water Act (1998) Section 1.1 (xxi) as follows: “riparian habitat'' includes the physical structure and associated vegetation of the areas associated with a watercourse which are commonly characterised by alluvial soils, and which are inundated or flooded to an extent and with a frequency sufficient to support vegetation of species with a composition and physical structure distinct from those of adjacent land areas.

In the case of the study area, the floodplain adjacent to the major channels in the area is clearly identified as riparian woodland due to the plant species composition. Small channels have formed on the floodplains where water “takes a short-cut” over the floodplain during flood events.

11.4.1.3. Wetland Integrity Assessments

In determining the integrity of the water courses, the condition of the site and the indirect and direct disturbances is taken into account. The embankments, roads, alien invasive vegetation species, littering etc. was taken into account in determining the PES and EIS of these wetland units at the crossings.

Evidence was observed on site of transformation of the floristic characteristics of the site. Impacting activities which may have altered the expected floristic composition include alien infestation, impoundment and road upgrade crossings.

Table 16 indicate the PES and EIS as determined for the two PCD sites. The secondary roads, alien invasion, erosion and upstream mining had a definite impact on downstream areas.

Table 9 Present Ecological State and Ecological Importance & Sensitivity of the wetland and riparian systems on the proposed development site

Wetland	PES	EIS

Water course (Pollution Control Dam 1 - South)	Class E: Seriously Modified	High
Water course (North of Pollution Control Dam 2 - North)	Class C 2.1: Moderately modified	High

The PES of the PCD1 (opencast and underground mining area) is classified as water courses and has a 'Seriously Modified' PES with main impacts being from erosion and sedimentation. The EIS of the water course is 'HIGH' and represent water courses that are considered to be ecologically important and sensitive. The biodiversity of these floodplains may be sensitive to flow and habitat modifications. They play a role in moderating the quantity and quality of water of major rivers.

The drainage channel to the north of PCD2 (northern PCD) is currently classified as having a 'Moderately Modified' PES, due to the protected environment created by the riparian woodland along its banks, although the riverine system is still impacted by erosion, sedimentation and alien species invasion. This wetland system has a 'HIGH' EIS and is considered to be ecologically important and sensitive on a local scale. The original footprint was placed inside this channel, although after careful consideration it was moved to the south of this sensitive ecosystem. The biodiversity of these floodplains may be sensitive to flow and habitat modifications. They play a role in moderating the quantity and quality of water of major rivers.

11.5. Surface Water

The site is located within the B71E (northern section of site) and B41J (southern section of site) quaternary catchments and is situated in the Olifants Water Management Area. Quaternary catchment B41J drains towards the Moopetsi River, while B71E drains towards the Steelpoort River. Both rivers eventually joins the Olifants River situated approximately 30 km north-east of the study area (refer to Figure 20 below).

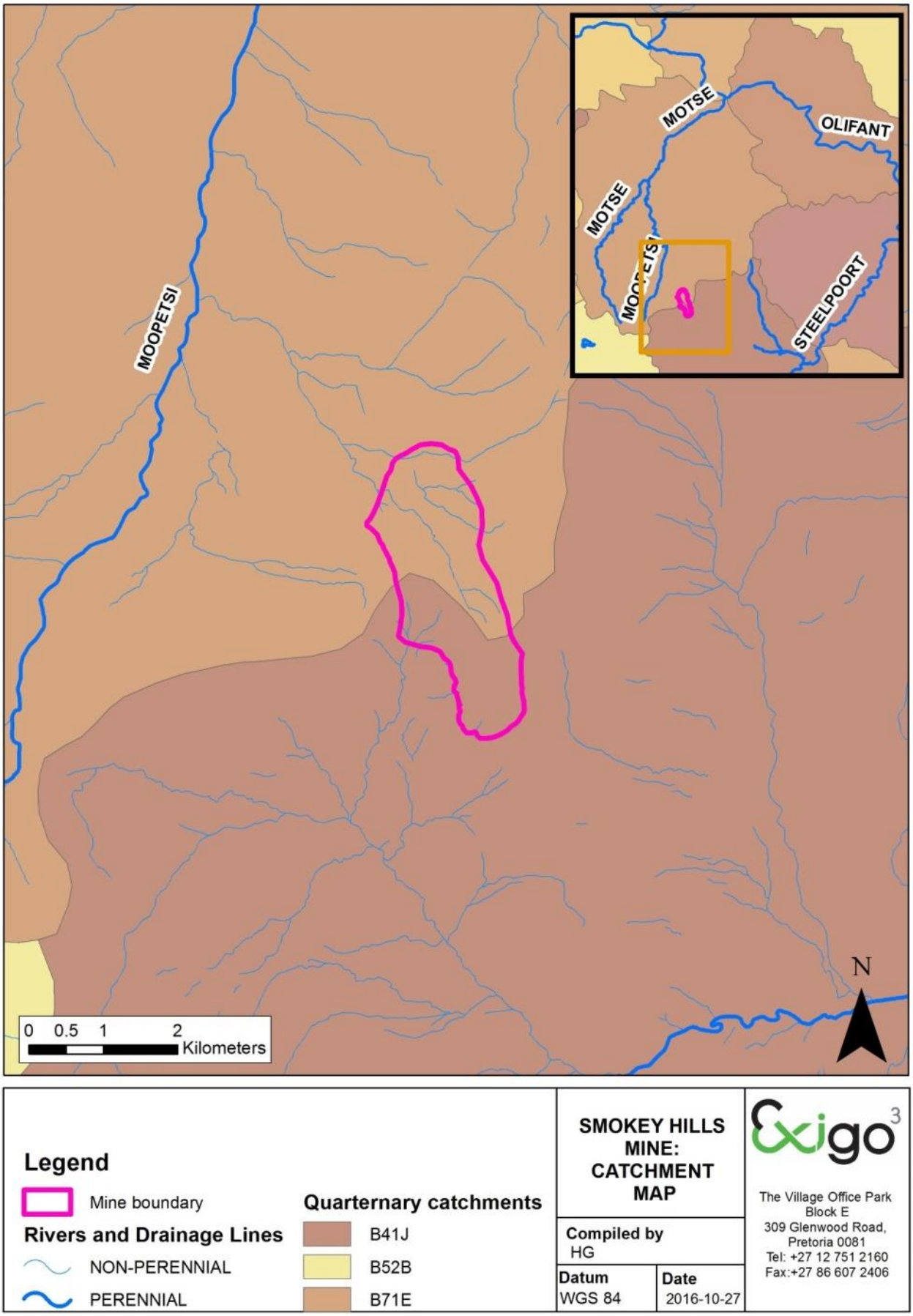

Figure 20: Catchment Map

11.6. Aquatic Biomonitoring

Biomonitoring was undertaken by Scientific Aquatic Services as two assessments, as performed in winter on the 22nd of August 2016, and in summer on the 17th of January 2017. Factors investigated included the visual conditions of the site, including an assessment of impacts on the stream, at each point. Habitat suitability for aquatic macro-invertebrates was evaluated using the Invertebrate Habitat Assessment System (IHAS) and Index of Habitat Integrity (IHI) method. The integrity of the aquatic macro-invertebrate community was assessed using the South African Scoring System version 5 (SASS5) and the Macro-Invertebrate Response Assessment Index (MIRAI). Whole Effluent Toxicity (WET) testing took place on two trophic levels, namely *Daphnia pulex*, and *Vibrio fischeri*.

Monitoring and toxicity points were undertaken at the following locations:

Table 10: Location of the monitoring and toxicity points with co-ordinates

Site	Description	Indices applied		GPS coordinates	
		Aug 2016	Jan 2017	South	East
SWSH1	Located upstream of the Smokey Hills Platinum mining operations in a mountain stream. This site will be used as a spatial reference site for sites SWSH2 and SWSH3.	Water quality SASS5& MIRAI IHAS & IHI *Toxicity testing	Water quality SASS5& MIRAI IHAS & IHI *Toxicity testing	24°33'54.72"S	30° 7'15.28"E
SWSH2	This site is located downstream of the Tailings facility. Any impact from the Smokey Hills Platinum operations will be evident at this point.	Water quality SASS5& MIRAI IHAS & IHI	The site was dry at the time of the assessment.	24°33'52.02"S	30° 6'44.46"E
**SWSH3	Located downstream of the Smokey Hills Platinum mine, where the two tributaries confluence.	Water quality SASS5& MIRAI IHAS & IHI *Toxicity testing	Water quality SASS5& MIRAI IHAS & IHI *Toxicity testing	24°33'49.07"S	30° 6'24.88"E
SWSH6	Located upstream of the Smokey Hills Platinum mining operations in a mountain stream. This site will be used as a spatial reference site for sites SWSH3 and SWSH8.	The site was dry at the time of the assessment.		24°35'5.39"S	30° 7'35.83"E
SWSH8	Located downstream of the Smokey Hills Platinum mine, upstream of the confluence with site SWSH3.	The site was dry at the time of the assessment.		24°34'9.84"S	30° 6'45.54"E

Please refer to Figure 21 for an indication of the positions of the biomonitoring points.

Figure 21: Biomonitoring sites presented on a digital satellite image

Results

Electrical conductivity (EC) was shown to increase in a downstream direction during both assessments (August 2016 and January 2017), this is indicative of dissolved salts entering the system. This can partly be attributed to flow variability and the natural geology of the area compounded by the nationwide drought at the time of the assessment, resulting in increased evaporation and concentration of salts in the system. pH values at all the sites are considered largely natural during the August 2016 assessment, while the pH decreases to slightly acidic conditions at the downstream site (SWSH3) during the January 2017 assessment. Dissolved oxygen (DO) saturation can be considered as adequate at the upstream site SWSH1, while both sites SWSH2 and SWSH3 are considered supersaturated during the August 2016 assessment. During the January 2017 assessment, DO saturation at both the SWSH1 and SWSH3 sites are considered adequate. Point and non-point sources of pollution entering the system as a result of the adjacent rural settlement and illegal mining activity by community members during the January 2017 assessment confounds any attempt at quantifying potential impact from mining activities.

During both assessments, a clear decrease in SASS5 and ASPT scores in a downstream direction was evident. The overall decrease in macro-invertebrate community diversity and sensitivity at the downstream site SWSH3 is likely as a result of the increase in EC during both assessments, the supersaturated conditions during the August 2016 assessment and the slightly acidic conditions during the January 2017 assessment. Impacts from the Smokey Hills Mine is considered possible, although, cumulative impacts from the adjacent rural settlement and illegal mining activities during the January 2017 assessment are considered more likely to negatively impact the system.

During the August 2016 assessment, both the upstream SWSH1 and downstream SWSH3 sites posed a slight acute (Class 2) toxicological hazard to the aquatic ecological community. During the January 2017 assessment, the hazard classification increased to acute toxicological (Class 3) hazards at both the SWSH1 and SWSH3 sites. Spatially, the hazard classifications remained unchanged during both assessments and any impact on the toxicity of the system due to impacts from the Smokey Hills Mine is considered unlikely.

It can be concluded that this unnamed tributary of the Moopetsi River is in a largely to seriously modified condition, and hence the sensitivity of the system is very limited. The data is congruent with the DWS Resource Quality Information Services (RQIS) Present Ecological State (PES) classification of Category E conditions for the Moopetsi River. Refer to Appendix 7.6 for additional information.

11.7. Hydrogeology and aquifers

11.7.1. Aquifer types

The DWS 1:500 000 hydrogeological map series of South Africa provides spatial description of the types of aquifers found across South Africa. According to the hydrogeological map of the area, the type of aquifers that occur at the Smokey Hills site are predominantly fractured rock aquifers.

The following aquifers and main hydrogeologic units were defined for the Smokey Hills mine site:

Table 11: Aquifers and hydrogeologic zones found at the Smokey Hills study area

No	Aquifer or aquitard	Typical thickness	Aquifer type
1	Shallow alluvial aquifer	< 5 m	Porous
2	Weathered and fractured norite aquifer	5 - 10 m	Intergranular and fractured
3	Dyke contact aureole aquifer	20 - 50 m	Fractured rock
4	Fresh norite aquitard (bedrock)	> 100 m	Aquitard (unfractured)

11.7.2. Aquifer Classification

The aquifer classification was compiled in 2006 by SRK and was guided by the principles set out in South African Aquifer System Management Classification (1995) by R. Parsons. The conditions of the aquifer system are unchanged from the original assessment and thus the classification is still valid. The assessment found the aquifer to be a sole source aquifer, moderately vulnerable and therefore must be considered as strictly non-degradation.

According to Parsons (1995), aquifer classification is based on the aquifer characteristics and the non-technical and water-supply considerations. The classifications and definitions for each aquifer system are summarised in Table 12 below.

Table 12: Definitions of Aquifer System Management Classes (After Parsons (1995))

Sole source aquifer	An aquifer which is used to supply 50% or more of domestic water for a given area, and for which there are no reasonable available alternative sources should the aquifer be impacted upon or depleted. Aquifer yields and natural water quality are immaterial
Major aquifer system	Highly permeable formations, usually with a known probable presence of significant fracturing. They may be highly productive and able to support large abstractions for public supply and other purposes. Water quality is generally very good (less than 150 mS/m)
Minor aquifer system	These can be fractured or potentially fractured rocks, which do not have a high primary permeability, or other formations of variable permeability. Although these aquifers seldom produce large quantities of water, they are important both for local supplies and supplying base flow to rivers

Non aquifer system	These are formations with negligible permeability that are generally regarded as not containing groundwater in exploitable quantities. Water quality may also be such that it renders the aquifer as unusable. However, groundwater flow through such rocks, although imperceptible, does take place, and needs to be considered when assessing the risk associated with persistent pollutants
Special aquifer system	An aquifer designated as such by the Minister of Water Affairs, after due process

The aquifer system and the aquifer vulnerability are assigned a value as defined in Table 13 below. Through multiplying the aquifer system value by the vulnerability value the Groundwater Quality Management (GQM) index is determined. Based on this value the level of protective action that must be upheld is recommended. The values shaded in blue indicate the rating of the aquifer.

Table 13: Aquifer classification system

Aquifer system		**Aquifer vulnerability**	
Management qualification		**Classification**	
Class	**Points**	**Class**	**Points**
Sole Source Aquifer System	6	High	3
Major Aquifer System	4	Medium	2
Minor Aquifer System	2	Low	1
Non-Aquifer System	0		
Special Aquifer System	0-6		

GQM INDEX	**Level of protection**
<1	Limited Protection
1 to 3	Low Level Protection
3 to 6	Medium Level Protection
6 to 10	High Level Protection
>10	Strictly Non- Degradation

11.7.3. Groundwater Monitoring Results

Groundwater and surface water are being actively monitored at the Smokey Hills mine. Groundwater variables being monitored include hydraulic head changes at ten boreholes and groundwater quality changes at seven boreholes. The information below also indicate the results from previous hydrocensuses. Hydraulic heads and groundwater qualities were also measured at these boreholes where possible.

11.7.3.1. Groundwater levels (Hydraulic heads)

A total of 12 boreholes are being actively monitored and their hydraulic heads available from 24 June 2016 to 20 September 2016 (see Table 11). The shallowest (minimum) hydraulic head measured is 3.17 metres below collar height (mbch), the deepest (maximum) is at 21.35 mbch and the mean hydraulic head at 8.4 mbch. There is in general, a lack of hydraulic head information to the south of the site, in the location of the processing plant and change houses. Exigo has been appointed to perform groundwater geophysics in this vicinity and monitoring boreholes will be drilled to provide adequate

hydraulic head and water quality information for this area of the Smokey Hills mine site.

Table 14 provides information of the hydraulic heads being monitored at the mine. The graph in Figure 22 describes the groundwater level change over time. The map shows the location of the boreholes and also provides with colour, an indication of the current status of groundwater monitoring boreholes.

The mine was already in Care and Maintenance when water level measurements were taken. The decline in hydraulic head seen over the last 4 months is attributed to dry season conditions with little groundwater recharge to the aquifers over this time.

Table 14: Hydraulic head monitoring results summary for Smokey Hills

	Hydraulic heads or groundwater levels (mbch)			
Date measured:	24-Jun-2016	26-Jul-2016	22-Aug-2016	20-Sep-2016
BH2	2.96	3.29	3.64	
BH3S	2.33	2.95	3.22	3.51
BH3D		2.59	2.89	3.17
BH4S		6.48	6.88	7.27
BH4D	5.61	5.97	6.39	6.76
BH5S		5.43	5.84	6.21
BH5D	4.94	5.53	5.90	6.30
SH02		20.39	21.05	21.35
SH03		15.30	15.45	15.58
SH04		5.41	5.54	5.49
Minimum	**2.3**	**2.6**	**2.9**	**3.2**
Maximum	**5.6**	**20.4**	**21.1**	**21.4**
Mean	**4.0**	**7.3**	**7.7**	**8.4**

11.7.3.2. Groundwater quality results

At the time that the groundwater assessment was undertaken (latter half of 2016), groundwater quality was actively monitored on a monthly basis at 7 boreholes from April 2014 to September 2016. Table 15 and Figure 23 summarises the latest water quality results per borehole.

In general, the groundwater qualities at the Smokey Hills site are good compared to the SANS 241 with rare exceedances over time. One element and especially one of its compounds is however of concern when using the SANS 241 standards and that element is nitrogen (N) from its compound NO_3.

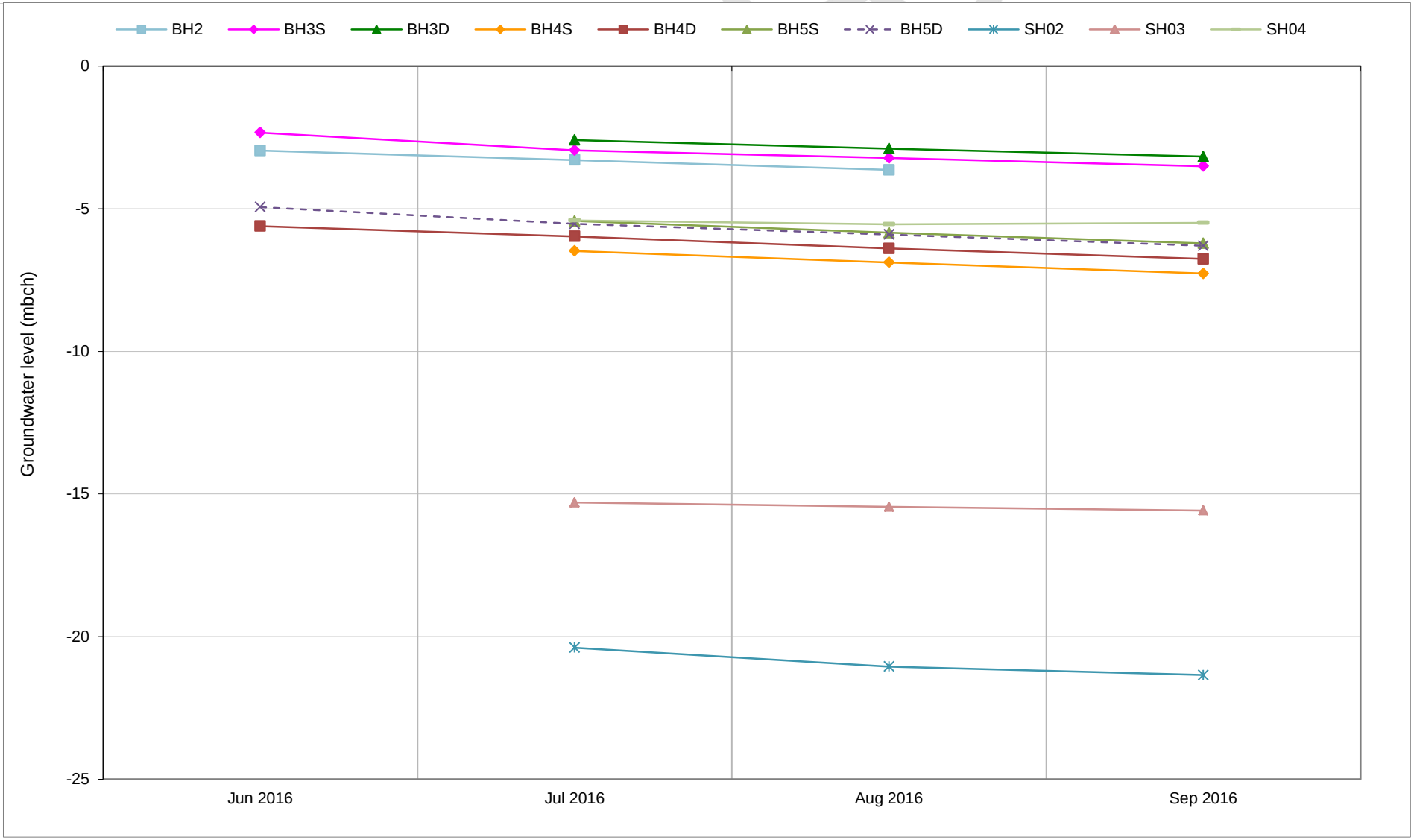

Figure 22: Hydraulic heads monitored over the winter period at Smokey Hills mine

Table 15: Table showing latest groundwater quality analysis results for Smokey Hills mine

Borehole Number	HCO_3	Ca	Cl	F	Mg	K	Na	SO_4	NO_3-N	NH_4-N	CO_3	pH	EC	TDS
	mg/ℓ	mg/ℓ	mg/ℓ	mg/ℓ	mg/ℓ	mg/ℓ	mg/ℓ	mg/ℓ	mg/ℓ	mg/ℓ	mg/ℓ	[ ]	mS/m	mg/ℓ
BH3D	428	89	58	<0.263	91	0.2	27	79	7.5	0.143	1.5	7.6	113	754
BH5S	402	31	39	<0.263	74	5.4	26	<0.141	1.36	0.853	5.1	8.1	74	406
H12-1790	378	96	47	<0.263	75	0.1	21	88	9.4	0.121	5.3	8.2	106	696
H12-2361	487	108	27	0.333	68	0.1	20	58	7.8	0.022	2.8	7.8	96	610
SH02	186	135	23	<0.263	64	0.5	22	91	79	1.010	0.5	7.5	135	930
SH03	202	131	24	<0.263	63	1.0	25	89	71	0.960	0.8	7.6	130	1008
SH04	367	102	7.9	<0.263	71	0.2	18	25	36	0.147	0.8	7.4	100	664
SANS 241 (2015)*	N/A	N/A	≤ 300	≤ 1.5	N/A	N/A	≤ 200	≤500	≤0.9	N/A	N/A	≥5; ≤9.7	≤170	≤1200
IWUL Limits **	N/A	46.35	61.49	0.13	74.44	N/A	38.17	28.17		N/A	N/A	9.11	102.52	N/A

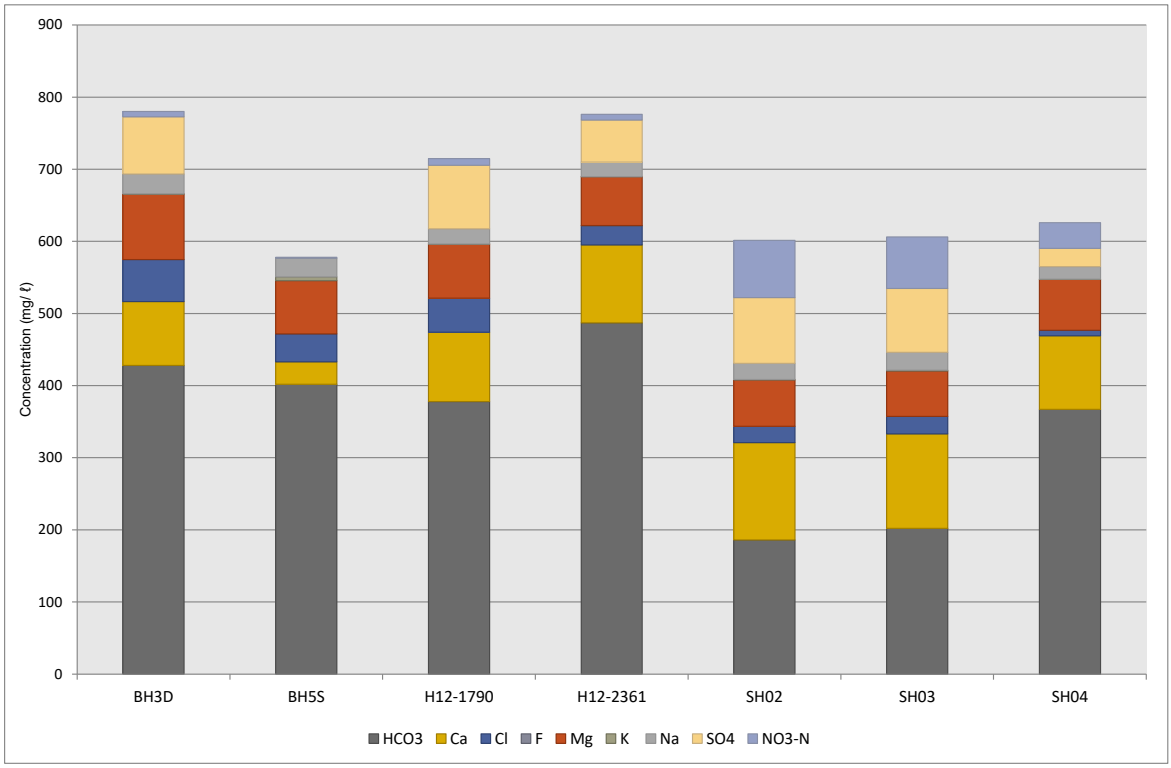

Figure 23: Composite bar chart of groundwater quality results from monitoring on 20 September 2016

11.8. Heritage Resources

The history and archaeology of the larger Sekhukhune region around Steelpoort is primarily well known for the occurrence of Stone Age and Iron Age farmer occurrences. As noted in the initial HIA report for Maandagshoek (Roodt, 2006) the area is rich in archaeological sites, dating from the Early Iron Age (800AD) to the Pedi occupation of the area. This is most probably due to the safety the valley offered from outside attacks, but also as a result of the deep and rich sedimentary soils of the lowlying area. It is also of historical importance due to the activities of the Berlin Missionary Society who entered the area in the time of Chief Sekwati. However, no sites of heritage potential were noted in the respective proposed project footprints. The absence of heritage sites in these areas might be attributed to the fact that the surroundings at the Smokey Hills mine have been transformed in places by mining and prospecting and mining at the site occurs on steep slopes which would probably be unsuitable for prolonged human settlement.

11.8.1. The Stone Age

In this area, Stone Age material generally occurs along drainage lines and exposed surfaces in donghas in the landscape. During the site survey no Stone Age material was documented along the proposed Smokey Hills Project footprint areas.

11.8.2. The Iron Age Farmer Period

A frontier zone between the north and the south, the Steelpoort landscape is rich in precolonial Iron Age Farmer Period remnants. However, the site inspection produced no Iron Age farmer sites, probably since sites of past human occupation generally occur in valley bottoms and flatter parcels of land near sources of water.

11.8.3. Historical / Colonial Period

European and local farming communities settled in the Steelpoort during the Colonial Period in the last century. However, no Historical / Colonial Period occurrences were observed in the proposed Smokey Hills Project footprint areas.

11.8.4. Graves

No graves or human burials were noted in the proposed Pollution Control Dams Project footprint areas. It should be noted that, in the rural areas of the Limpopo Province graves and cemeteries often occur within settlements or around homesteads but they are also randomly scattered around archaeological and historical settlements. The probability of human burials encountered during development should thus not be excluded. In addition, human remains and burials are commonly found close to archaeological sites; they may be found in "lost" graveyards, or occur sporadically anywhere as a result of prehistoric activity, victims of conflict or crime. It is often difficult to detect the presence of archaeological human remains on the landscape as these burials, in most cases, are not marked at the surface.

11.9. Socio-Economic Environment

According to the Social Scoping Report by Kruger (2016) the project area is situated along rugged hills within a number of rural settlements in the Steelpoort Valley. The villages of Gamagabane, Mahlokwane, Mampahlane, Sehlako and Mpuru border the mine to the north, west and south. The terrain consists predominantly of mountainous areas with flatter parcels of developable land on the plateaus, terraces and areas adjacent to the rivers. The proposed opencast mining footprints are situated in areas that have been altered extensively as a result of earlier opencast mining, prospecting and the establishment of mine roads. The areas at the base of the Hill 2 and Hill 3 are densely populated and most of the valley area is under cultivation. Generally, human impact has resulted to the degradation of the environment as a result of over-exploitation and overgrazing. This manifests in large-scale surface soil loss both as donga and sheet erosion which is prevalent throughout the region.

The proposed site falls within the Fetakgomo-Greater Tubatse Local Municipality (FGTLM) area which forms part of the Sekukhune District Municipality.

GTLM has a council that consists of a total of 77 councillors. Of these, 39 are ward councillors while 38 were proportionally elected. The Executive Committee of the municipality is led the Mayor while the municipal Speaker presides over the Council in terms of Section 49 and 37 of the Local Government: Municipal Structures Act 117 of 1998 respectively.

This large municipality comprises of 39 wards and 297 villages. The municipality is largely dominated by rural landscape with only 06 (six) proclaimed townships.

The area of jurisdiction of FGTLM is approximately 4 550 km2 (2016/17 Draft Consolidated IDP for Fetakgomo Greater Tubatse Municipality). According to the FGTLM the northern part has inferior social and engineering infrastructure which impacts on the stability of the economy in this area. This may be attributed to the rural nature of the area. As such, upliftment in the area is of critical importance. There is also virtually no economic base in the northern part of the area and the area is solely dependent on government handouts and migrant labour income for survival.

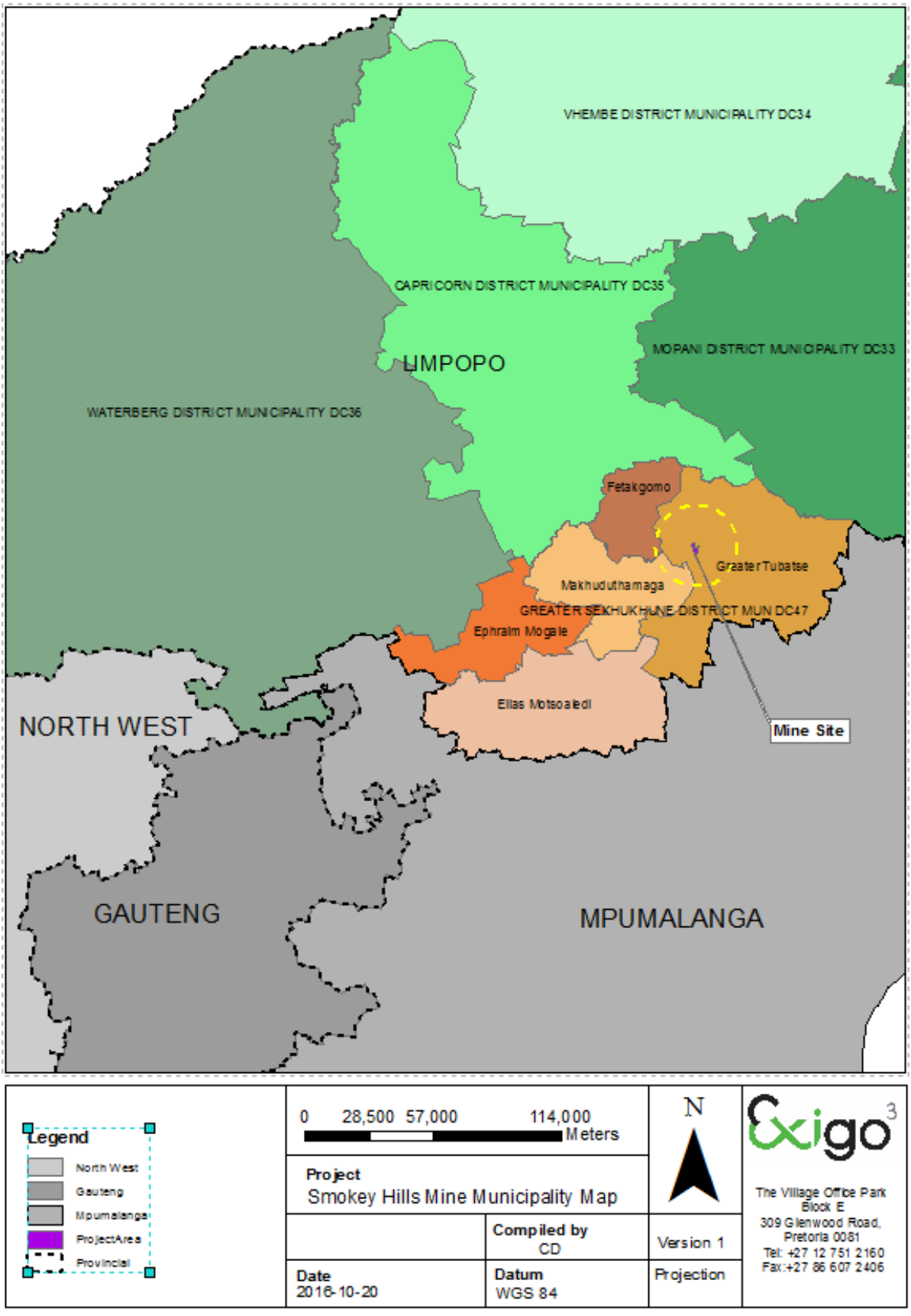

Figure 24: Municipality Map

11.9.1. Population Profile

According to the 2011 STASA information; the total population of the former FGTLM combined is approximately 429471 with 106 050 households. In 2016 a community survey was undertaken for FGTLM, making it the most highly populated municipality within the Sekhukhune district. It also appears from in the current 2016 Community Survey as compared to the 2011 STASA results that the Fetakgomo Tubatse Local Municipality there has been a population of 490 381 with household increase of 125 454 . As per the current community survey 2016 the former Greater Tubatse local Municipality increased with 0.037% and the former Fetakgomo local municipality increase slightly with 0.007. The total percentages of FGTLM as combined increased with 0.043% which put the municipality as the highest in the District.

The population in the district per genders is shown below in Table 16.

Table 16: Sekhukhune District Population group by gender (FGTLM IDP, 2016/17)

	2011 STATSA			2016 Community Survey			
	Male	Female	Total	Male	Female	Total	Growth Rate
Sekhukhune	497648	579191	1076840	548463	621299	1169762	0.019

The table above indicate the total number of Households for Fetakgomo and Tubatse Municipality in 2011 as combined was 106 050 and 125 454 in 2016; which makes the municipality the biggest municipality in the District. The municipality has shown a growth of 8% growth in 2016; this might be due to the mining activities taking place in the area.

Language

The languages that are spoken within the GTLM include Sepedi (94%)and isiZulu (1.2%). Other languages make up the remaining 4.8% (StatsSA, 2011). Table 17 below provides more detail the languages spoken by the people of GTLM.

Table 17: Frequently spoken languages in households in FGTLM (StatsSA, 2011)

Afrikaans	English	IsiXhosa	IsiZulu	Sepedi	Sesotho	SiSwati	Xitsonga	Tshivenda	Others
0.5%	0.5%	0.3%	1.2%	94%	0.1%	0.4%	0.6%	0.1	0.4

Gender & Age Distribution

Table 18 shows that the total population is dominated by young people below 18. The age categories below the age of 18 comprise 51% of the population. The ratio for females is almost equal at ages between 0-17 and then this makes a change. Male-female distribution is then dominated by females for example, from ages 19-65.

Table 18: Gender and age distribution within former GTLM (GTLM IDP, 2016/17)

Age	Male	Female	Grand Total
0-4	22 878	21 999	**44 877**

Age	Male	Female	Grand Total
5-9	20 271	22 517	**42 788**
10-14	22 440	23 354	**45 794**
15-19	19 349	19 811	**39 160**
20-24	15 907	19 112	**35 019**
25-29	13 245	14 505	**27 750**
30-34	10 667	11 582	**22 249**
35-39	7324	8828	**16 152**
40-44	6076	9519	**15 595**
45-49	4952	7109	**12 061**
50-54	4180	6448	**10 628**
55-59	3241	3993	**7234**
60-64	2552	4075	**6627**
65-69	2256	3015	**5271**
70-74	1484	3086	**4570**
75-79	1124	2618	**3742**
80-84	362	1322	**1684**
85+	335	1911	**2266**
Grand Total	**158 663**	**184 804**	**335 676**

Education Levels

Education levels in the Limpopo province lag behind those of other provinces of South Africa. While average literacy levels for South Africa were 82.2%, literacy levels for Limpopo were 73.6% in 1991. The Greater Tubatse Local Municipality has 163 primary schools, 92 secondary schools and 8 private schools with a total of 114 723 learners and 3689 educators. Bugersfort, Ohrigstad and Steelpoort each have a primary school and Burgersfort has additional private primary and secondary schools. Two state of the art schools have been developed by the Department of Limpopo, i.e. Nthame primary school at Riba and Batubatse primary school in Prakitiseer. In rural areas, an abundance of primary schools tends to be common as many pupils leave school early in search of employment in order to support their families. Those that can afford to continue to secondary school do so within the area or in more developed towns outside the municipality (GTLM IDP, 2016/17). 22.6% of people above the age of 20 have completed matric (grade 12); while 6.6% have higher education (STATSSA, 2011). Figure 25 shows education levels in Greater Tubatse Local Municipality.

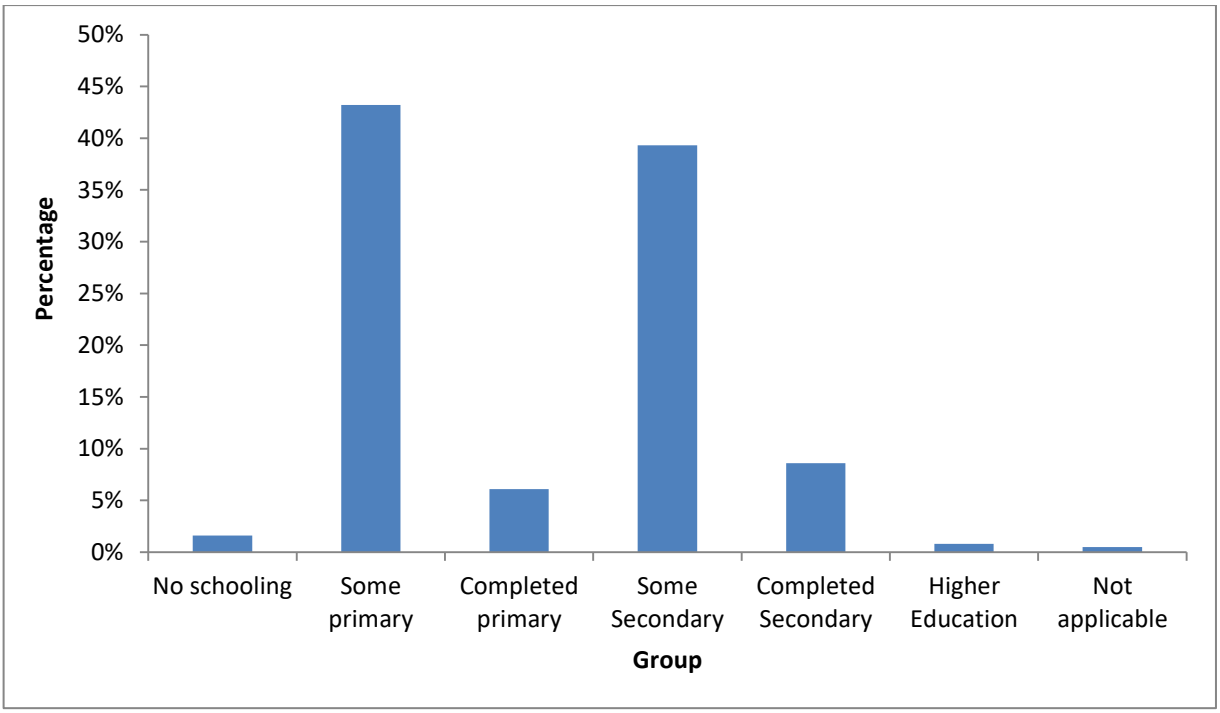

Figure 25: Education levels in Greater Tubatse Local Municipality (StatsSA, 2011)

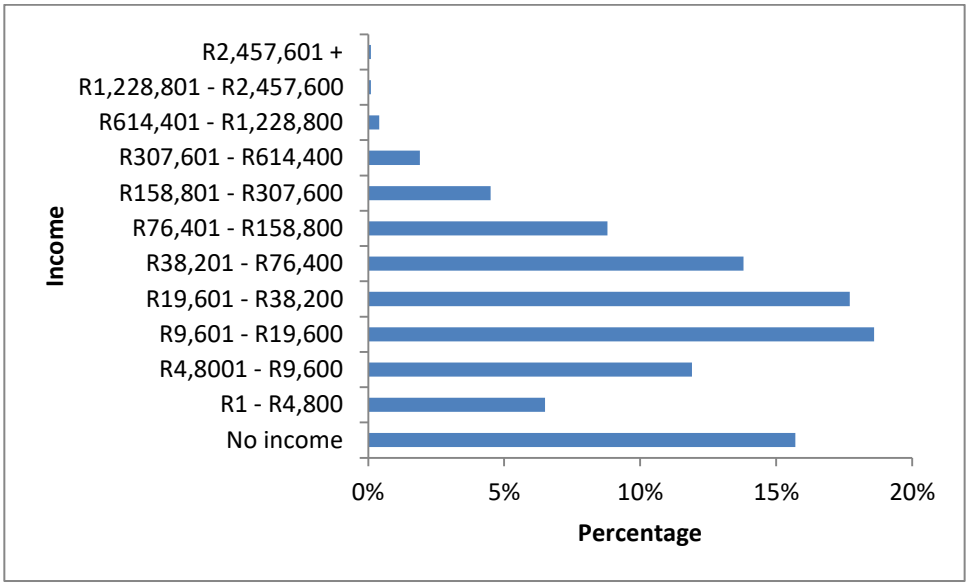

Figure 26: Average household income in GTLM (StatsSA, 2011)

Employment Status

The Former Greater Tubatse Local Municipality has a youth unemployment rate of 59.6%. In 2009, The Greater Tubatse Local Municipality had the highest rate of unemployment at 28 022 and in 2015 it still had the highest with 22 264 people unemployed (LED, 2015). Figure 27 illustrates the employment status of the people of GTLM.

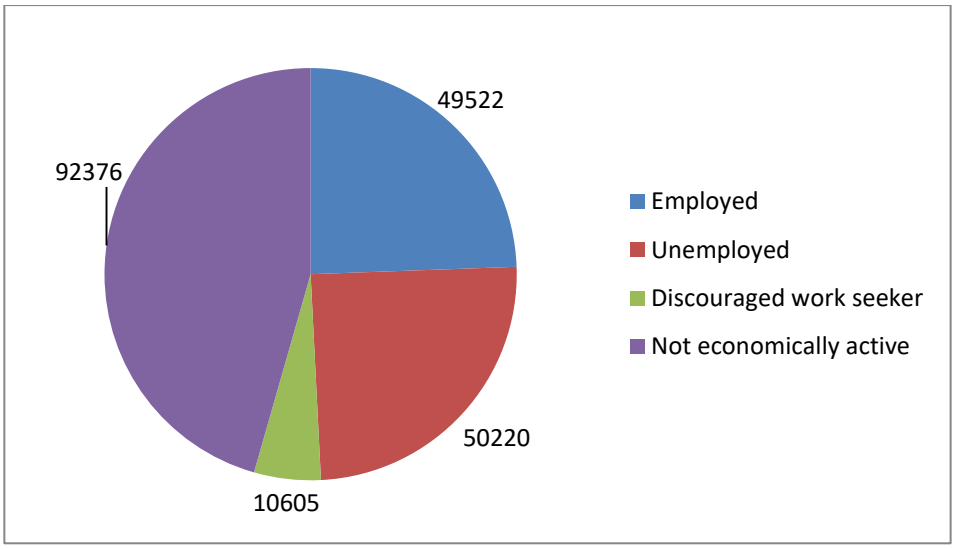

Figure 27: Employment status of people aged 15-64 in GTLM (StatsSA, 2011).

11.9.2. Infrastructure and Services

Owing to FGTLM's rural nature, the municipality is plagued by challenges of poor or backlogged service delivery. The provision and maintenance of services become costly because most of the settlements are situated far apart. Some areas are also not large enough to achieve the economic threshold required to make social facilities available in a manner that is economically viable (FGTLM IDP, 2016/17). Majority of infrastructural projects within FGTLM are Expanded Public Works Programme related projects. Such projects aid in the generation of employment opportunities and the assurance of the improvement of the socio-economic conditions within the area. 800 jobs were created in the 2014/2015 financial year through the construction of the small access bridges and other related projects.

12. DESCRIPTION OF THE CURRENT LAND USES

The current land-use of the proposed development is mining, with the neighbouring areas being used for grazing by livestock as well as small scale subsistence crop cultivation. The major land use of the study area as classified by the Environmental Potential Atlas of South Africa (2000) is vacant / unspecified land (Soil Potential Report: Exigo, 2016).

13. DESCRIPTION OF SPECIFIC ENVIRONMENTAL FEATURES AND INFRASTRUCTURE ON THE SITE.

In terms of the Department of Environmental Affairs and Tourism (DEAT) guidelines for Integrated Environmental Management (IEM), sensitive landscapes are a broad term applying to: Nature conservation or ecologically sensitive areas – indigenous plant communities (particularly rare communities or forests), wetlands, rivers, river banks, lakes, islands, lagoon, estuaries, reefs, inter-tidal zones, beaches and habitats of rare animal species; Unstable physical environments, such as unstable soil and geo-technically unstable areas; Important nature reserves – river systems, groundwater systems, high potential agricultural land; Sites of

special scientific interest; Sites of social significance or interest – including sites of archaeological, historic, cultural spiritual or religious importance and burial sites; and Green belts or public open space in municipal areas.

Sensitive landscapes in terms of the above definition are illustrated in Figure 28 and Figure 29 below and include:

- Ecological Sensitive areas; and
- Surface Water features.

Noted that no features of heritage sensitivity were found within the proposed footprint areas.

14. ENVIRONMENTAL AND CURRENT LAND USE MAP

(Show all environmental and current land use features)

Refer to Figure 28, Figure 29 that show ecological sensitivity maps for each of the two PCDs proposed. A land cover map is provided in Figure 30.

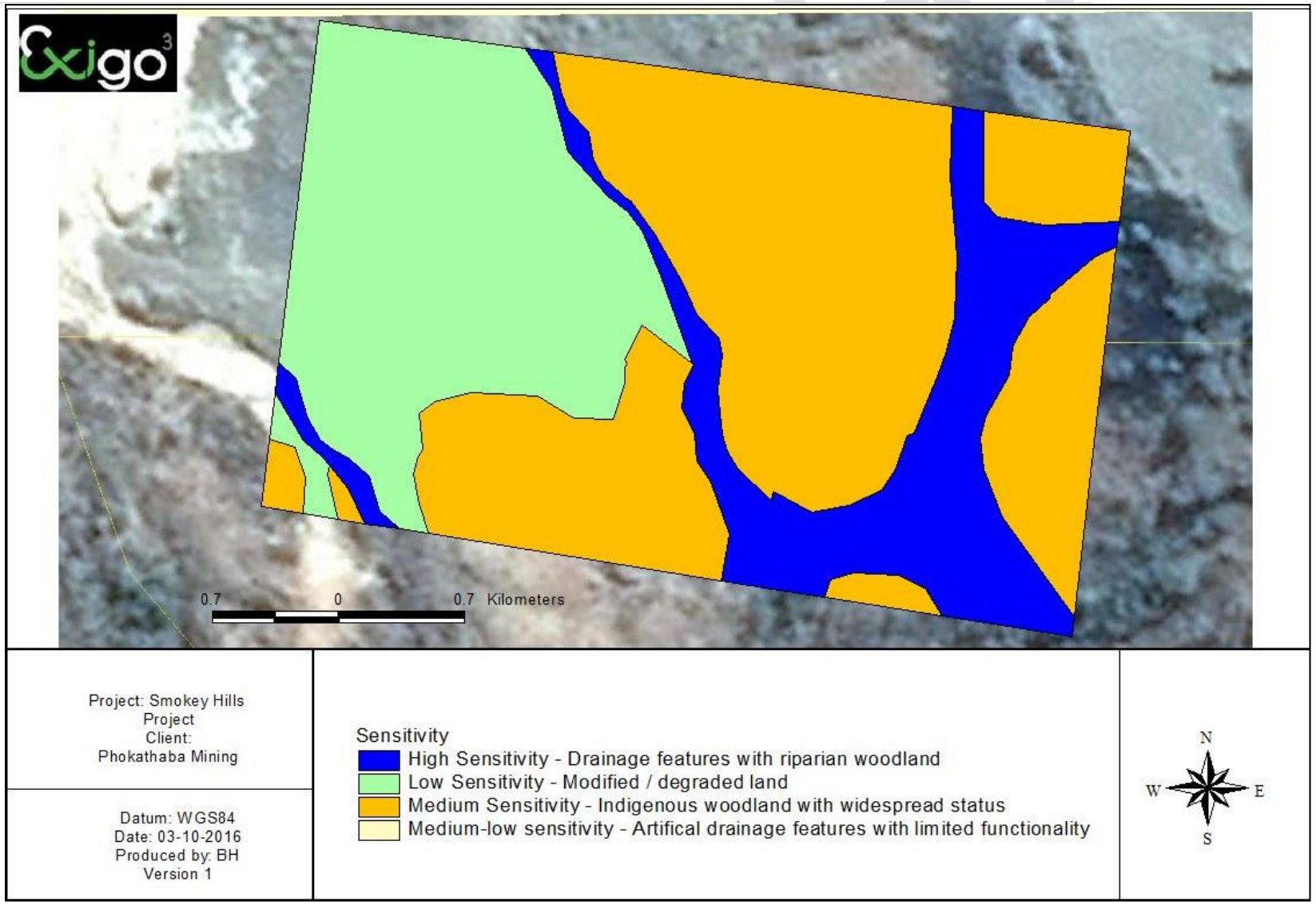

Figure 28: Ecological Sensitivity Map for the PCD1 (mining area)

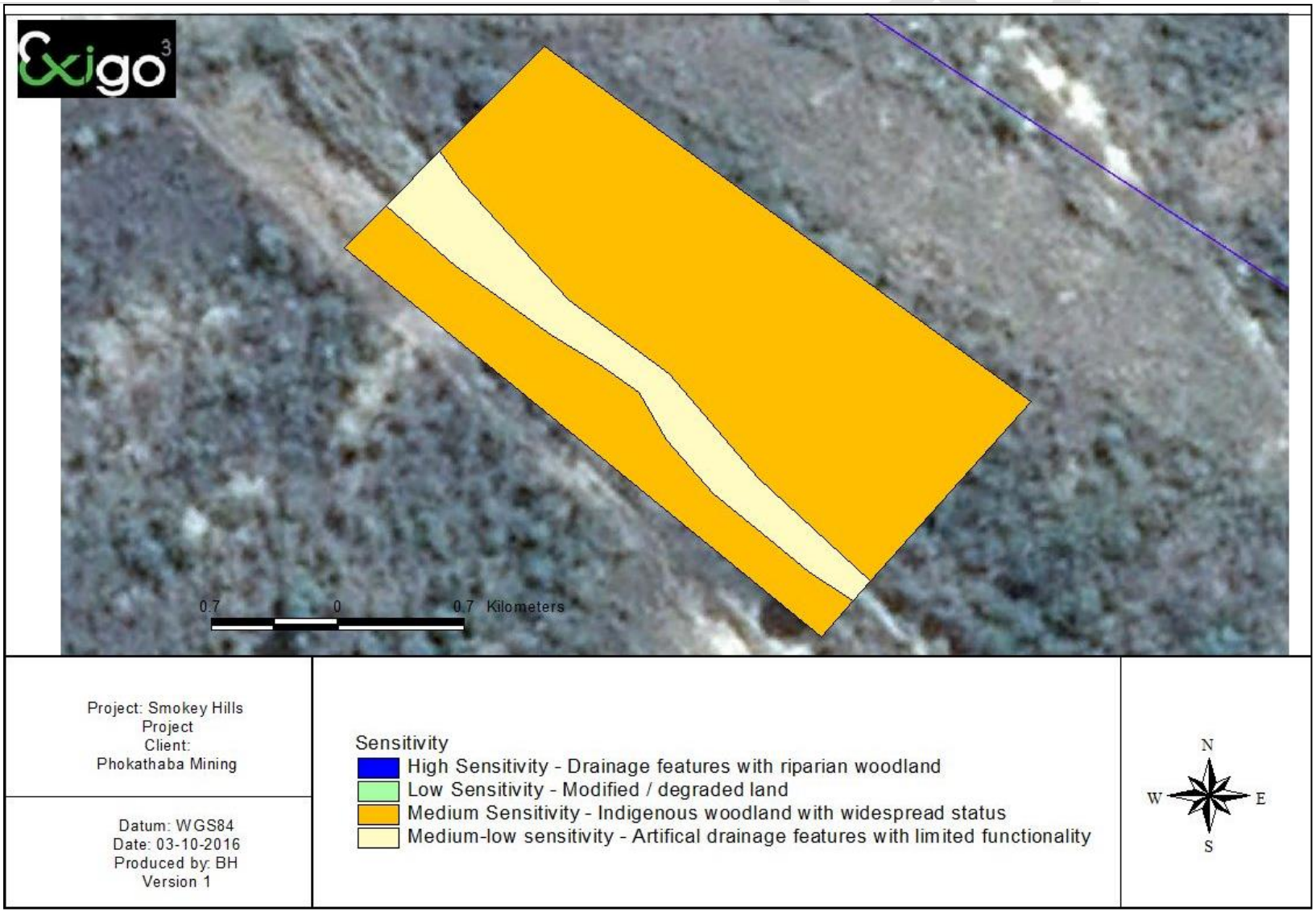

Figure 29: Ecological Sensitivity Map for the PCD2 (between plant and tailings dam)

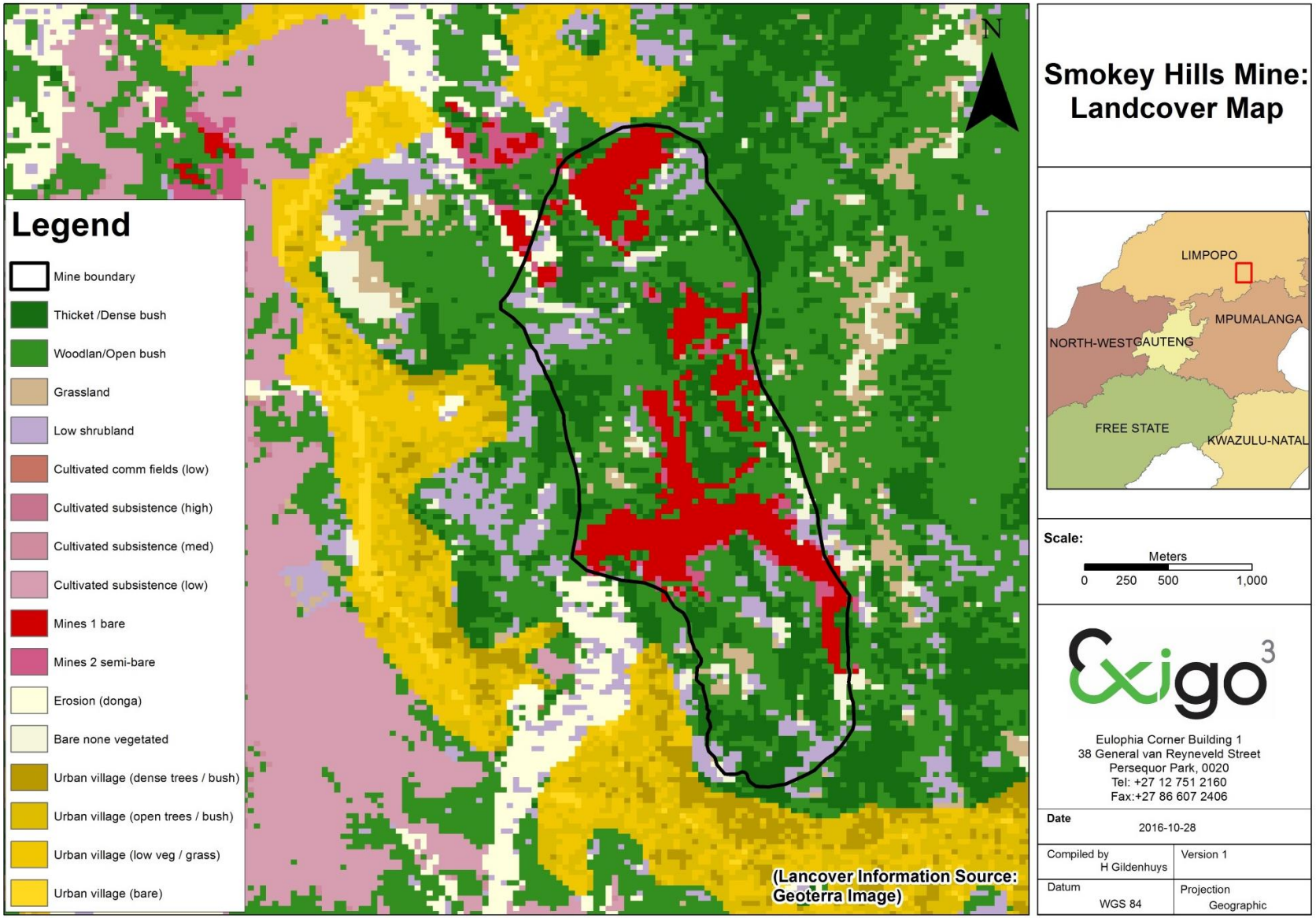

Figure 30: Landcover Map (Source: 2013 – 2014 South African National Land-Cover Dataset, Geoterra Image)

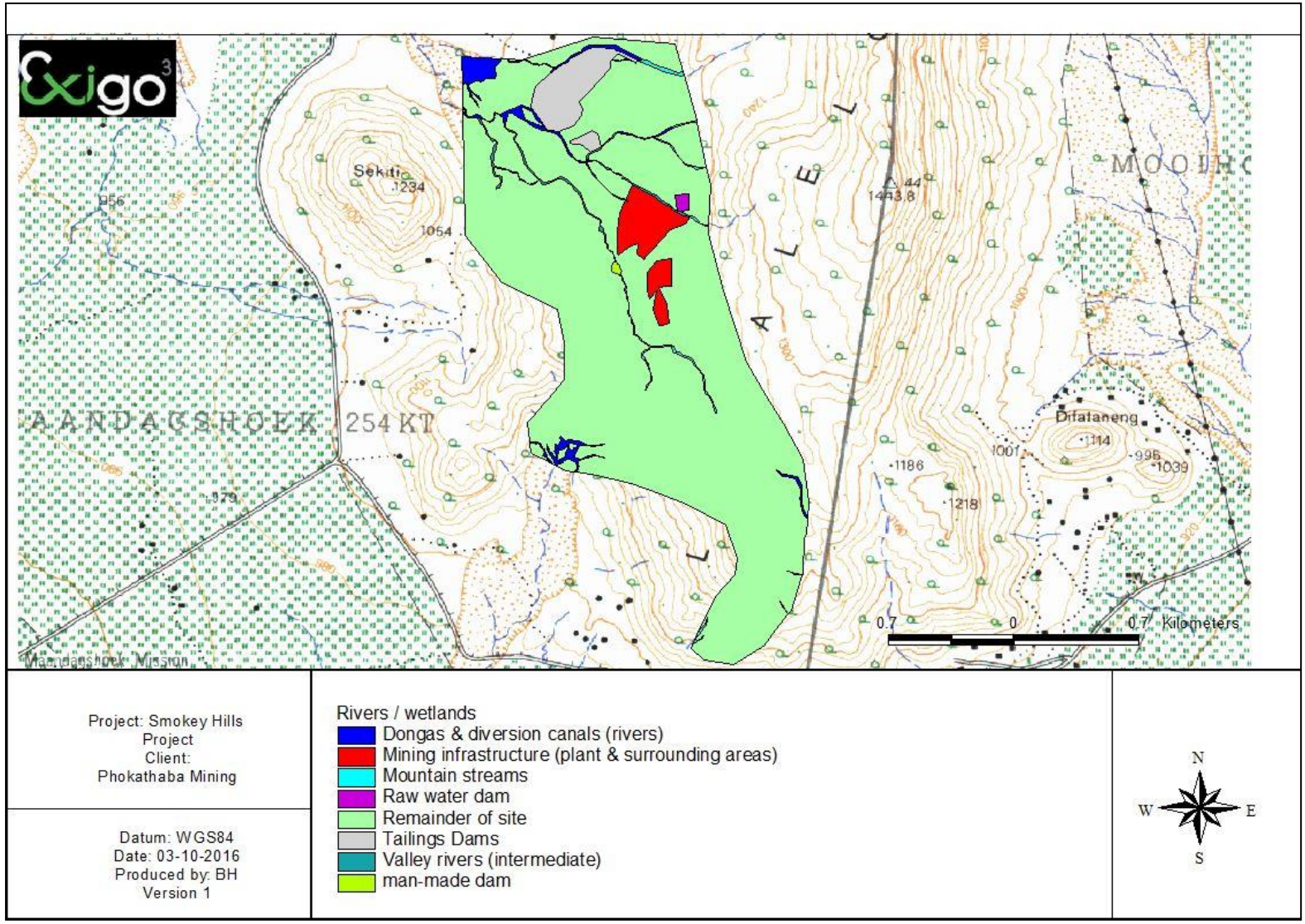

Figure 31: Wetland / riparian delineation map for the Smokey Hills Mine (Henning, 2016c).

15. 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)

Table 19: Impact Assessment Table

Nr	Activity	Impact	Without or With Mitigation	Nature (Negative or Positive Impact)	Probability		Duration		Scale		Magnitude/ Severity		Significance		Mitigation Effect
					Magnitude	Score	Magnitude	Score	Magnitude	Score	Magnitude	Score	Score	Magnitude	
Ecology															
Planning Phase															
1	Eradication of protected trees / flora through permit application	Delay of mining onset	WOM	Negative	Definite	5	Short term	1	Local	1	Low	2	20	Negligible	Can be avoided, managed or mitigated
			WM	Negative	Highly Probable	4	Short term	1	Local	1	Low	2	16	Negligible	Can be reversed
Construction Phase															
2	Clearing of vegetation for infrastructure causing direct habitat destruction / fragmentation	Habitat destruction / fragmentation of fauna habitats	WOM	Negative	Definite	5	Permanent	5	Local	1	Medium	6	60	Moderate	May cause irreplaceable loss of resources
			WM	Negative	Definite	5	Permanent	5	Local	1	Low	2	40	Low	Can be avoided, managed or mitigated
3	Topsoil & subsoil stripping, exposure of soils, ore and rock to wind and rain during construction causing erosion and sedimentation	Soil erosion and sedimentation	WOM	Negative	Definite	5	Short term	1	Site	2	Medium	6	45	Moderate	May cause irreplaceable loss of resources
			WM	Negative	Highly Probable	4	Short term	1	Local	1	Low	2	16	Negligible	Can be avoided, managed or mitigated
4	Vegetation clearing / vehicle movement	Spreading and establishment of alien invasive species	WOM	Negative	Highly Probable	4	Permanent	5	Site	2	High	8	60	Moderate	May cause irreplaceable loss of resources
			WM	Negative	Highly Probable	4	Long term	4	Site	2	Low	2	32	Low	Can be reversed
5	Vegetation clearing / vehicle movement	Habitat degradation due to dust	WOM	Negative	Definite	5	Short term	1	Regional	3	High	8	60	Moderate	May cause irreplaceable loss of resources
			WM	Negative	Definite	5	Short term	1	Site	2	Medium	6	45	Moderate	Can be reversed
6	Heavy machinery and vehicle movement on site	Spillages of harmful substances	WOM	Negative	Probable	2	Short term	1	Regional	3	Medium	6	20	Negligible	May cause irreplaceable loss of resources
			WM	Negative	Probable	2	Short term	1	Site	2	Low	2	10	Negligible	Can be reversed
7	Heavy machinery and vehicle movement on site; Construction of infrastructure, roads etc. on site	Road mortalities of fauna / impact of human activities on site	WOM	Negative	Highly Probable	4	Short term	1	Regional	3	Medium	6	40	Low	May cause irreplaceable loss of resources
			WM	Negative	Probable	2	Short term	1	Site	2	Low	2	10	Negligible	Can be avoided, managed or mitigated
Soils															
Planning Phase															
1	Obtaining of IWUL for crossings (wetland soils) and mining layout on sensitive soils	Delay of mining onset	WOM	Negative	Definite	5	Short term	1	Local	1	High	8	50	Moderate	Can be avoided, managed or mitigated
			WM	Negative	Highly Probable	4	Short term	1	Local	1	Medium	6	32	Low	Can be reversed
Construction Phase															

Nr	Activity	Impact	Without or With	Nature (Negative or Positive	Probability		Duration		Scale		Magnitude/ Severity		Significance		Mitigation Effect
2	Heavy machinery and vehicle movement on site	Soil compaction	WOM	Negative	Definite	5	Short term	1	Local	1	High	8	50	Moderate	May cause irreplaceable loss of resources
			WM	Negative	Definite	5	Short term	1	Local	1	Low	2	20	Negligible	Can be reversed
3	Topsoil & subsoil stripping, exposure of soils, ore and rock to wind and rain during construction causing erosion and sedimentation in wetlands	Soil erosion and sedimentation	WOM	Negative	Definite	5	Short term	1	Site	2	High	8	55	Moderate	May cause irreplaceable loss of resources
			WM	Negative	Highly Probable	4	Short term	1	Local	1	Medium	6	32	Low	Can be avoided, managed or mitigated
4	Heavy machinery and vehicle movement on site	Spillages of harmful substances	WOM	Negative	Highly Probable	4	Short term	1	Regional	3	Medium	6	40	Low	May cause irreplaceable loss of resources
			WM	Negative	Probable	2	Short term	1	Site	2	Low	2	10	Negligible	Can be reversed
5	Topsoil & subsoil stripping	Soil destruction and sterilization	WOM	Negative	Definite	5	Permanent	5	Local	1	Medium	6	60	Moderate	May cause irreplaceable loss of resources
			WM	Negative	Definite	5	Long term	4	Local	1	Low	2	35	Low	Can be reversed
6	Topsoil & subsoil stripping, Clearing of vegetation through wetlands and water courses for road crossings	Loss of land capability	WOM	Negative	Definite	5	Permanent	5	Local	1	Medium	6	60	Moderate	May cause irreplaceable loss of resources
			WM	Negative	Highly Probable	4	Long term	4	Local	1	Low	2	28	Low	Can be reversed
Heritage															
Planning Phase															
1	Planning	Site EXIGO-SHP-FT01 (low significance)	WOM	Negative	Improbable	1	Permanent	5	Local	1	Low	2	8	Negligible	Can be avoided, managed or mitigated
			WM	Positive	Improbable	1	Permanent	5	Local	1	Low	2	8	Negligible	Can be avoided, managed or mitigated
2	Planning	Site EXIGO-SHP-FT02 (high significance)	WOM	Negative	Improbable	1	Permanent	5	Local	1	Low	2	8	Negligible	Can be avoided, managed or mitigated
			WM	Positive	Improbable	1	Permanent	5	Local	1	Low	2	8	Negligible	Can be avoided, managed or mitigated
Hydrogeology															
Operational Phase															
1	Construction and operation of Pollution Control Dam (PCD)	Alteration of natural topography and drainage patterns	**WOM**	**Negative**	Highly Probable	4	Medium term	3	Local	1	Medium	6	40	Low	Can be reversed
			WM	**Negative**	Probable	2	Medium term	3	Local	1	Low	2	12	Negligible	Can be reversed
2	Construction and operation of Pollution Control Dam (PCD)	Alteration of runoff and surface water volumes reaching downstream surface water system/water bodies	**WOM**	**Negative**	Highly Probable	4	Medium term	3	Regional	3	Medium	6	48	Moderate	Can be reversed
			WM	**Negative**	Highly Probable	4	Medium term	3	Local	1	Low	2	24	Low	Can be reversed
3	Construction and operation of Pollution Control Dam (PCD)	Increased recharge due to permanent ponding of water on underlying soil and weathered rock	**WOM**	**Positive**	Highly Probable	4	Long term	4	Local	1	Low	2	28	Low	Can be reversed
			WM	**Positive**	Definite	5	Long term	4	Local	1	Low	2	35	Low	Can be reversed
4	Groundwater and surface water monitoring: Failure to adhere to monitoring and maintenance requirements	Prolonged contamination of groundwater and surface water, erosion	**WOM**	**Negative**	Probable	2	Medium term	3	Site	2	Medium	6	22	Low	Can be avoided, managed or mitigated
			WM	**Positive**	Improbable	1	Short term	1	Local	1	Low	2	4	Negligible	Can be avoided, managed or mitigated
5	Groundwater and surface water monitoring: Failure to adhere to monitoring and maintenance	No indication of how to manage process water infiltration into groundwater	**WOM**	**Negative**	Definite	5	Medium term	3	Site	2	Medium	6	55	Moderate	Can be avoided, managed or mitigated

Nr	Activity	Impact	Without or With	Nature (Negative or Positive	Probability		Duration		Scale		Magnitude/ Severity		Significance		Mitigation Effect
	requirements		**WM**	**Positive**	Improbable	1	Short term	1	Local	1	Low	2	4	Negligible	Can be avoided, managed or mitigated
6	Storm water management	Flooding of the processing plant and surrounding land uses	**WOM**	**Negative**	Highly Probable	4	Short term	1	Regional	3	Medium	6	40	Low	Can be avoided, managed or mitigated
			WM	**Negative**	Improbable	1	Short term	1	Local	1	Low	2	4	Negligible	Can be avoided, managed or mitigated

16. METHODOLOGY USED IN DETERMINING THE SIGNIFICANCE OF ENVIRONMENTAL IMPACTS

(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).

An impact can be defined as any change in the physical-chemical, biological, cultural and/or socio-economic environmental system that can be attributed to human activities related to alternatives under study for meeting a project need. Assessment of impacts will be based on the Department of Environmental Affairs Guideline Document: EIA Regulations 2010. The significance of the aspects/impacts of the process will be rated by using a matrix derived from Plomp (2004) and adapted to some extent to fit this process. These matrixes use the consequence and the likelihood of the different aspects and associated impacts to determine the significance of the impacts.

The significance of the impacts will be determined through a synthesis of the criteria below:

Probability. This describes the likelihood of the impact actually occurring.

Improbable:	The possibility of the impact occurring is very low, due to the circumstances, design or experience.
Probable:	There is a probability that the impact will occur to the extent that provision must be made therefore.
Highly Probable:	It is most likely that the impact will occur at some stage of the development.
Definite:	The impact will take place regardless of any prevention plans, and there can only be relied on mitigatory actions or contingency plans to contain the effect.

Duration. The lifetime of the impact

Short term:	The impact will either disappear with mitigation or will be mitigated through natural processes in a time span shorter than any of the phases.
Medium term:	The impact will last up to the end of the phases, where after it will be negated.
Long term:	The impact will last for the entire operational phase of the project but will be mitigated by direct human action or by natural processes thereafter.
Permanent:	Impact that will be non-transitory. Mitigation either by man or natural processes will not occur in such a way or in such a time span that the impact can be considered transient.

Scale. The physical and spatial size of the impact

Local: The impacted area extends only as far as the activity, e.g. footprint

Site: The impact could affect the whole, or a measurable portion of the above mentioned properties.

Regional: The impact could affect the area including the neighbouring residential areas.

Magnitude/ Severity. Does the impact destroy the environment, or alter its function.

Low: The impact alters the affected environment in such a way that natural processes are not affected.

Medium: The affected environment is altered, but functions and processes continue in a modified way.

High: Function or process of the affected environment is disturbed to the extent where it temporarily or permanently ceases.

Significance. This is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required.

Negligible: The impact is non-existent or unsubstantial and is of no or little importance to any stakeholder and can be ignored.

Low: The impact is limited in extent, has low to medium intensity; whatever its probability of occurrence is, the impact will not have a material effect on the decision and is likely to require management intervention with increased costs.

Moderate: The impact is of importance to one or more stakeholders, and its intensity will be medium or high; therefore, the impact may materially affect the decision, and management intervention will be required.

High: The impact could render development options controversial or the project unacceptable if it cannot be reduced to acceptable levels; and/or the cost of management intervention will be a significant factor in mitigation.

The following weights will be assigned to each attribute:

Aspect	Description	Weight
Probability	Improbable	1
	Probable	2
	Highly Probable	4
	Definite	5

Duration	Short term	1
	Medium term	3
	Long term	4
	Permanent	5
Scale	Local	1
	Site	2
	Regional	3
Magnitude/Severity	Low	2
	Medium	6
	High	8
Significance	Sum (Duration, Scale, Magnitude) x Probability	
	Negligible	<20
	Low	<40
	Moderate	<60
	High	>60

The significance of each activity will be rated without mitigation measures and with mitigation measures for both construction, operational and closure phases of the fluorspar mine development.

The mitigation effect of each impact will be indicated without and with mitigation measures as follows:

- Can be reversed
- Can be avoided, managed or mitigated
- May cause irreplaceable loss of resources

17. 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)

Kindly Refer to the Alternatives assessment discussion in Section 8.2.

17.1. CONSTRUCTION PHASE

17.1.1. Ecological Impacts

The following impacts will occur during the Construction Phase of the proposed Smokey Hills Opencast Mining Project:

The development and start-up of the construction phase for the PCDs covers the period of time when considerable changes take place as the dams are constructed. The most immediate impacts are seen as disruptions and disturbances to flora communities due to site clearance for construction of the pollution control dams. This is usually a significant change to the visual appeal of the area.

Exposure of soils to rainfall and wind may lead to atmospheric contamination by dust and increased erosion of the site and sedimentation of local water courses. An increase in the movement of construction vehicles will result in an increase in the dust levels in the area.

The following impacts will occur during the Construction Phase of the proposed project:

- The construction phase will result in loss of and damage to natural habitats if the vegetation is cleared for the development of infrastructure (pollution control dams, silt traps, channels etc.). Rehabilitation of some areas would be possible but there is likely to be long-term damage in certain areas. Most habitat destruction will be caused during the construction phase of the PCDs. Vegetation communities are likely to be impacted on a very small spatial scale in comparison to the extent of the vegetation communities' total area in the region;
- The PCD construction will inevitably result in natural movement patterns being disrupted and, to a varying degree depending on how different species react to these barriers will result in the fragmentation of natural populations. The construction of the PCDs will have a small impact in fragmenting the habitats on and around the site.
- The construction activities associated with the PCDs may result in soil disturbance and is usually associated with accelerated soil erosion. Soil erosion promotes a variety of terrestrial ecological changes associated with disturbed areas, including the establishment of alien invasive plant species, altered plant community species composition and loss of habitat for indigenous flora;
- Construction work will carry a risk of soil and water pollution, with construction vehicles contributing due to oil and fuel spillages. If not promptly dealt with, spillages or accumulation of waste matter can contaminate the soil and surface or ground water, leading to potential medium/long-term impacts on the flora of the site;

- The environmental impacts of wind-borne dust, gases and particulates from the construction activities associated with the proposed PCD developments will have an impact on the vegetation of the area when dust settles on plant material reducing the amount of light reaching the chlorophyll in the leaves, thereby reducing photosynthesis, which in turn reduces plant productivity, growth and recruitment;
- Continued movement of personnel and vehicles on and off the site during the construction phase, as well as occasional delivery of materials required for maintenance, will result in a risk of importation of alien species. Vehicles often transport many seeds and some may be of invader species, which may become established along the road, especially where the area is disturbed. The construction almost certainly carries by far the greatest risk of alien invasive species being imported to the site, and the high levels of habitat disturbance also provide the greatest opportunities for such species to establish themselves, since most indigenous species are less tolerant of disturbance. The biggest risk is that seeds of noxious plants may be carried onto the site along with materials that have been stockpiled elsewhere at already invaded sites.
- Disturbance of remnant terrestrial wild mammal, avian, amphibian and insect fauna would probably occur through physical habitat destruction, noise, traffic and movement of people. The impact of the construction would be low considering that animals would move away from the area, while some ground-burrowing species such as moles and reptiles might be killed in the process. There are however no specific red data species that would be critically impacted on by the constructional phase.
- Potential increase in feral animals and impact on indigenous fauna e.g. cats, rats.
- Illegal hunting or disturbance.
- Operation or disturbance during breeding season can precipitate long-term cumulative effect on populations.

The following impacts on the flora and fauna apply to the various components during the construction phase:

Activity 1: Vegetation clearing

- **Related impacts**
    - Habitat destruction or disturbance to ecosystems leading to reduction in the overall extent of a particular habitat;
    - Fragmentation of fauna habitats;
    - Potential establishment and spread of declared weeds and alien

invader plants

Activity 2: Topsoil and subsoil stripping

- Increased Soil erosion and sedimentation;
- Habitat degradation due to dust;

Activity 3: Vehicle movement

- Spillages of harmful substances to the ecosystem;
- Habitat degradation due to dust;
- Road mortalities of fauna

17.1.2. Impacts on Soils

The following impacts may occur during the construction phase of the mine:

- **Soil compaction** occurs when soil particles are pressed together, reducing pore space between them. Heavily compacted soils contain few large pores and have a reduced rate of both water infiltration and drainage from the compacted layer. In addition, the exchange of gases slows down in compacted soils, causing an increase in the likelihood of aeration-related problems. Finally, while soil compaction increases soil strength-the ability of soil to resist being moved by an applied force-a compacted soil also means that roots must exert greater force to penetrate the compacted layer. In the case of mining activities associated with the proposed mine during construction, soil compaction will be caused by regular heavy vehicle movement (wheel impact) and laydown areas of stockpiles on soils. If mitigating measures are not implemented the effect of the compaction will negatively affect soil structure of soils on the site.
- **Soil erosion and sedimentation**: Mining activities may further result in widespread soil disturbance and is usually associated with accelerated soil erosion, particularly in the study area during the summer months that receives high rainfall. Soil is especially prone to erosion once the topsoil has been stripped, leaving the soil exposed to wind and water erosion. Any soils left exposed throughout the construction phase could lead to significant erosion of the soils in the vicinity of the mining development. Soil, sediments and associated contaminants are transported into streams, rivers and other water bodies, resulting in the loss or alteration of habitats for aquatic organisms, as well as changes in water quality. The hardened surfaces and compacted soils of the development area will also lead to an increase in surface run-off during storm events which will likely be discharged via stormwater outlet points, concentrating flows leaving the development area. Soil erosion also promotes a variety of terrestrial ecological changes associated with disturbed areas, including the

establishment of alien invasive plant species, altered plant community species composition and loss of habitat for indigenous fauna and flora.

- **Soil pollution**: Construction work of the magnitude contemplated for the proposed mine will always carry a substantial risk of soil pollution, with large construction vehicles contributing substantially due to oil and fuel spillages. Building waste, batching plants, sewage and domestic waste are also potential contributors to this problem. If not promptly dealt with, spillages or accumulation of waste matter can contaminate the soil and surface or ground water, leading to potential medium/long-term impacts on soil chemical composition.
- **Soil destruction** is a form of soil degradation that involves the total destruction of natural soil bodies and all the parameters that led to the formation of the soil. Stripping of the topsoil during construction will remove the fertile layer of the soil. This will result in the loss of the soil carbon content as well as soil micro-organisms that support the soil nutrient cycles.
- **Loss of land capability**: This impact involves the loss of land available for farming and tourism: The area where the mine is proposed is located in an area used for game farming and livestock grazing, although some mining activities also occur in the broader area. The land in general has a low to almost zero capability for crop cultivation and can mostly be utilized as grazing for wildlife. The construction of the proposed mine will result in a total loss of the land capability as it currently is and will change the current land use from grazing to industrial land-use. The mining operations will have a negative impact initially and will reduce the percentage of land available for livestock grazing and agricultural activities done. The surface area of the mine to be disturbed is however relatively small and therefore the impact will not be as significant as anticipated.

17.1.3. Impacts on Heritage

Refer to Section 35.1.2.

17.1.4. Impact on Groundwater

The majority of impacts are predicted to occur during the operation phase and therefore the description of impacts is given in Section 17.2.3.

17.2. OPERATION PHASE

17.2.1. Ecological Impacts

No further impacts associated with the PCDs are anticipated during the Operational Phase of the Mine, other than stormwater collecting in the dams.

17.2.2. Impacts on Soils

No further impacts associated with the PCDs are anticipated during the Operational Phase of the Mine, other than stormwater collecting in the dams.

17.2.3. Impact on Groundwater

Transient simulations: Scenarios and mass transport results

Transient scenarios were developed and simulated to evaluate possible scenarios of water quality contaminant migration for the study area and model domain. The proposed PCDs will be lined so the groundwater impact over Life of Mine (LOM) will be negligible, assuming the liners do not fail. Pollution control dams (storm water dams) also do not normally store process water, only runoff water from site, thus their contamination potential is low, should the liner fail. From a water balance (water quantity) perspective there will be negligible reduction in groundwater recharge. The following numerical scenarios were however developed to evaluate the Smokey Hills mine and infrastructure (including TSF):

Scenario 1a: Present day conditions Operational Life of Mine 6 years

Based on the mass transport simulation results, plumes with concentrations elevated above the SANS limits, from the leaching of the Run of Mine (ROM) Ore Stockpile and the Waste Residue Stockpile, do not reach the villages or far past the mine boundary. The Tailings dam mass transport plume and reduction in groundwater quality will now be discussed in more detail.

At 6 years from restart of mining operations (Life of Mine reached, hereafter slurry/process water deposition at tailings dam stops), the Tailings dam TDS mass transport plume has travelled a maximum distance of approximately 590 m directly downstream of the tailings dam, where simulated plume concentrations are above the background TDS of 564 mg/ℓ.

It has travelled 385 m directly downstream of the tailings dam, with TDS concentrations above the 1200 mg/ℓ SANS limit, which can be harmful for human consumption.

The TDS plume has at this time just arrived at the community school borehole, but the concentrations are not elevated enough to pose a risk to human consumption. The simulated TDS water quality concentration at borehole H12-2361 is ± 640 mg/ℓ.

NO3

Possible contamination from nitrate (NO3) at the tailings dam was separately simulated within the mass transport model. NO3 is affected by natural biological decay in the environment and this decay was accounted for in the model. The NO3 mass transport plume thus behaves quite differently from the TDS mass transport plume and is much smaller than the TDS plume. The NO3 plume migrating downstream from the tailings dam completely decays in elevated concentration by the time it reaches H12-2361, so that NO3

as constituent does not pose a risk to community water supply boreholes downstream (Figure 32).

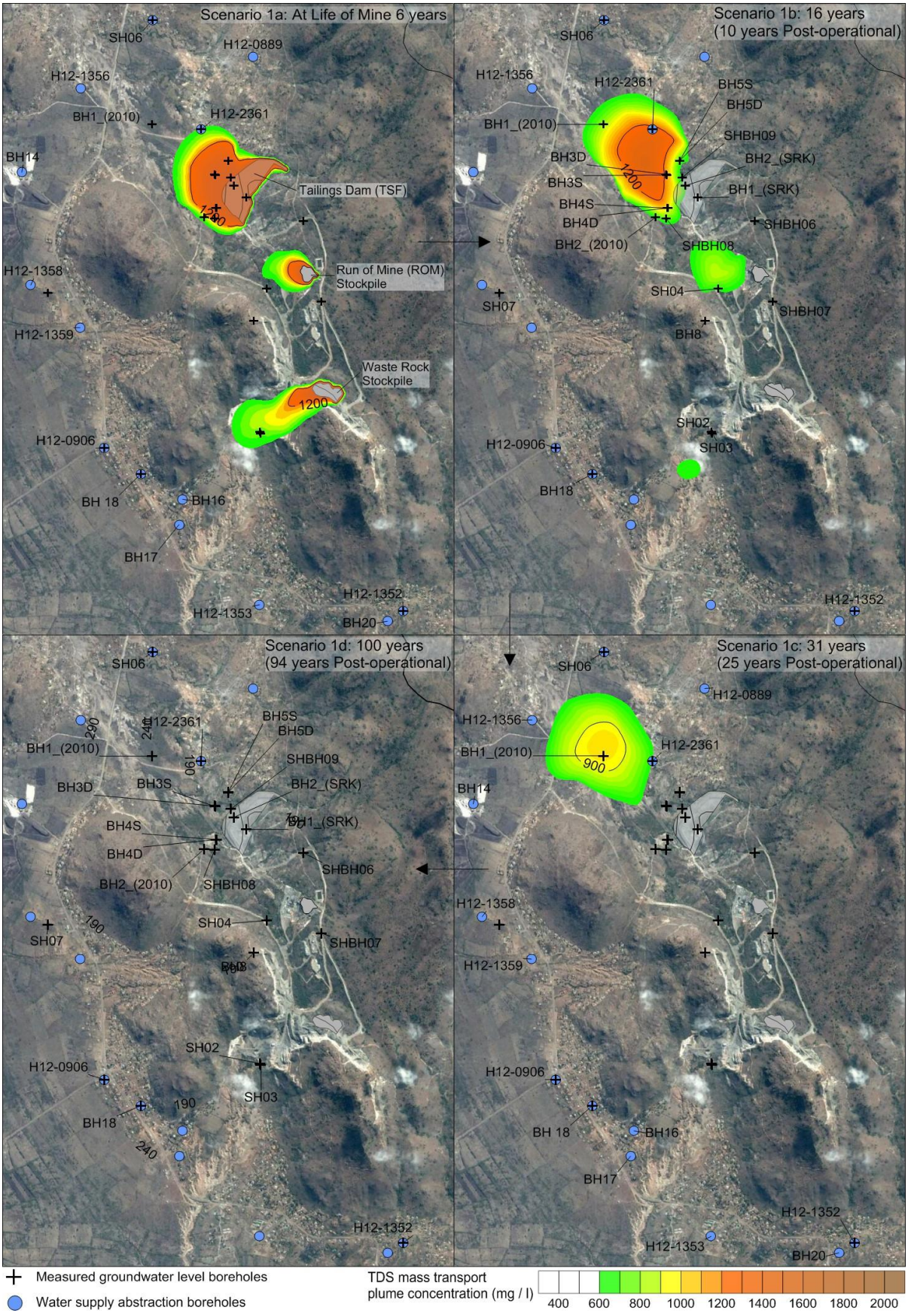

Figure 32: Zoom-in of Scenario 1a to 1d TDS mass transport results

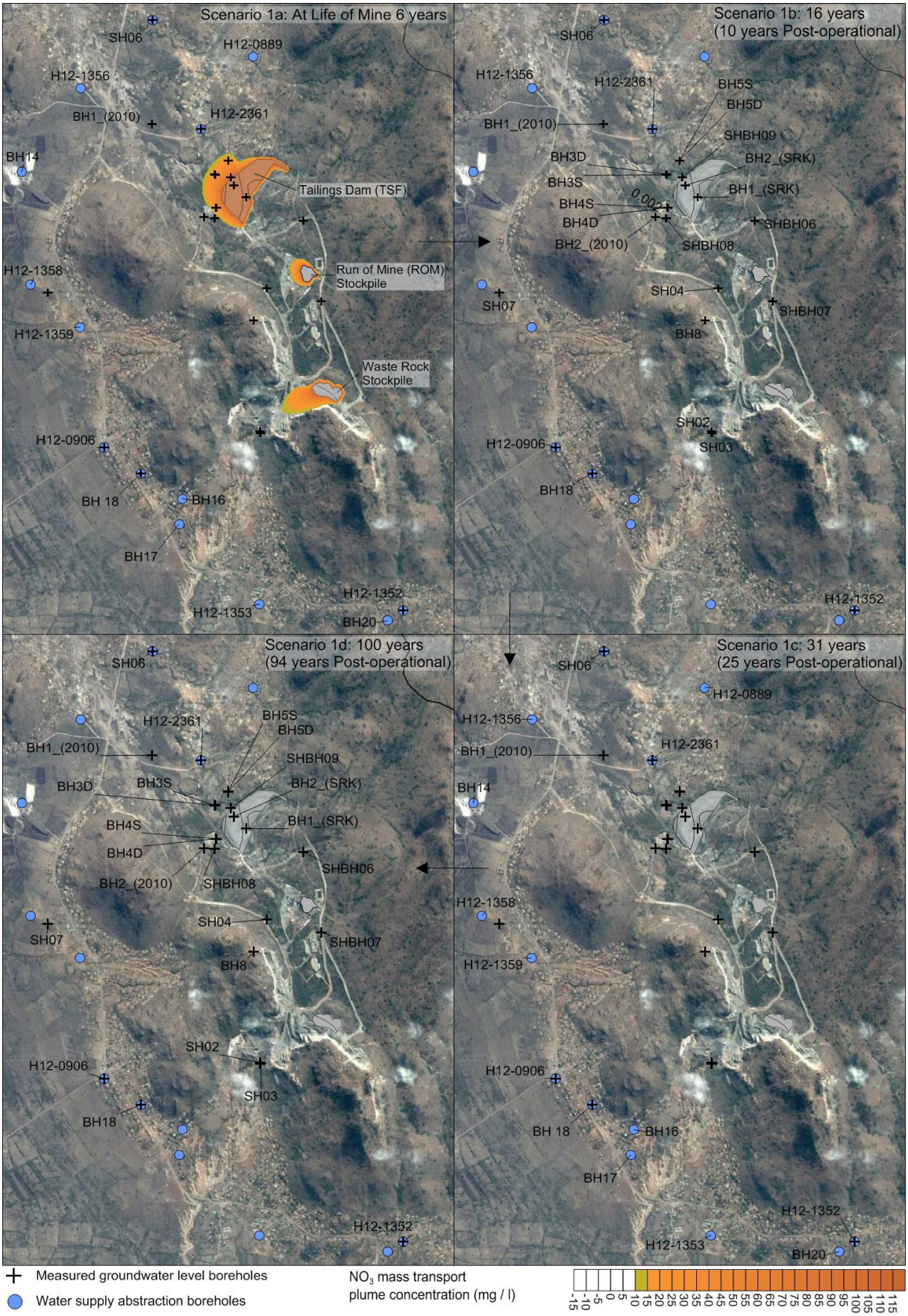

Figure 33: Scenario 1a to 1d NO3 mass transport results

Scenario 1b: Ten years post-operational phase (16 years total)

At 16 years from restart of mining operations (10 years after mining has ceased), the Tailings dam plume has travelled a maximum distance of approximately 1050 m directly downstream of the tailings dam, were simulated plume concentrations are above the background TDS of 564 mg/ℓ (Figure 32).

It has travelled 685 m directly downstream of the tailings dam, with TDS concentrations above the 1200 mg/ℓ SANS limit, which can be harmful for human consumption.

The TDS plume has at this time reached the community school borehole H12-2361 and the TDS concentrations here are now elevated above the SANS limit and pose a risk to human consumption. The simulated TDS water quality concentration at this time at borehole H12-2361 is ± 1300 mg/ℓ.

The NO3 plume migrating downstream from the tailings dam has decayed much more as 10 years has now passed since the LOM time. The maximum concentration of NO3 simulated in the plume downstream of the tailings dam is now 0.1 mg/ℓ, which is far below the SANS limit of 11 mg/ℓ or the IWUL limit of 10.46 mg/ℓ.

Scenario 1c: 25 years post operational (31 years total)

At 31 years from restart of mining operations (25 years after mining has ceased), the Tailings dam plume has travelled a maximum distance of approximately 1050 m directly downstream of the tailings dam, were simulated plume concentrations are above the background TDS of 564 mg/ℓ. Some concentrations behind it have however diluted back to background level (Figure 35).

At this time no TDS concentrations due to planned Smokey Hills mining activities are above the 1200 mg/ℓ SANS limit.

The TDS plume has passed the school community borehole H12-2361 at this simulation time and concentrations at the school borehole have diluted back to background concentrations. The plume can be described as a 6-year pulse that has passed H12-2361, but is also diluting as it moves forward and with time. The plume is at this simulation time on its way to another community borehole H12-1356, but no part of it is above the SANS 1200 mg/ℓ aesthetic limit anymore.

No NO3 concentrations above background are present from mining related activities anymore. This is actually true for Scenario 1b as well, 10 years after closure of the Smokey Hills mine.

Scenario 1d: 94 yeas post-operational (100 years total)

At 100 years from restart of mining operations (94 years after mining has ceased), the Tailings dam plume has completely been diluted by the fresh groundwater through which it has travelled and all concentrations are approximately at the TDS background

concentration. This is evident from the map for Scenario 2d in Figure 34 and Figure 35 (bottom right quadrant), where there is no trace of the plume because all TDS concentrations are below 564 mg/ℓ or at that level.

No NO3 concentrations above background are present from mining anymore.

Figure 34 Regional Model domain locations of TDS mass transport Scenarios 1a to 1d

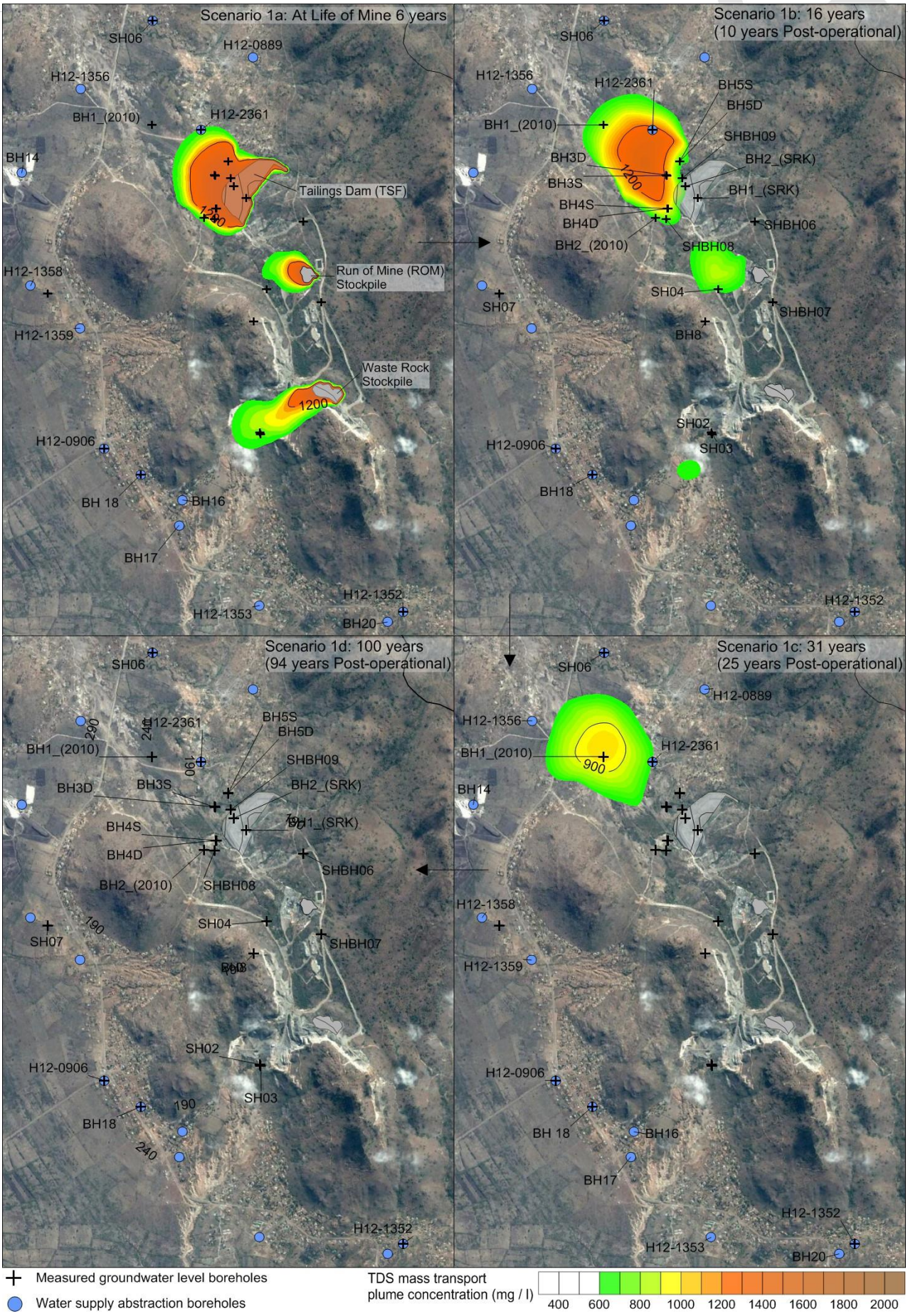

Figure 35 Zoom-in of Scenario 1a to 1d TDS mass transport results

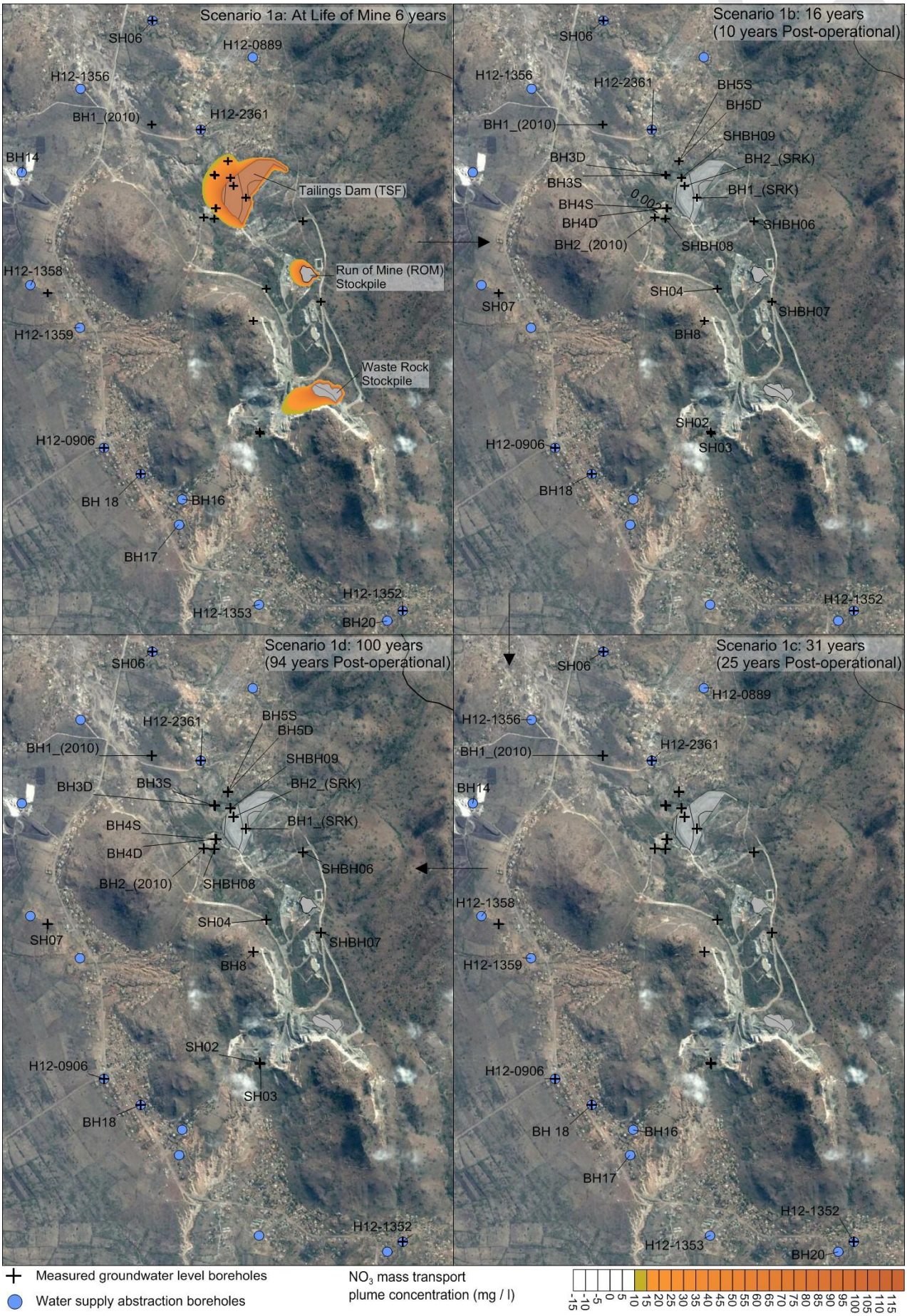

Figure 36 Scenario 1a to 1d NO_3 mass transport results

Scenario 2a: Seepage Capturing at LOM 6 years (6 years total)

In order to stop the possible downstream migration of the contamination plume from the Smokey Hills tailings dam (TSF), hypothetical seepage capturing boreholes were implemented and tested in the model. The concept is that abstraction at the seepage capturing boreholes creates steeper hydraulic gradients towards the seepage capturing boreholes, thus "capturing" the contamination plume. Both TDS and NO3 were simulated. TDS plume movement is not a big concern as the seepage capturing boreholes only had to be pumped during the operational phase (LOM 6 years) and ±1 year thereafter to reduce the concentration enough, so that receiving downstream borehole concentrations were below the SANS limit of 1200 mg/ℓ.

The TDS and NO3 source terms concentrations in the model used were calculated from the 90th percentile of the 2 poorest groundwater quality monitoring boreholes SH02 and SH03.

At 6 years from restart of mining operations (Life of Mine reached, hereafter slurry/process water deposition at tailings dam stops) and including seepage capturing boreholes, the Tailings dam TDS plume has travelled a maximum distance of approximately 370 m directly downstream of the tailings dam, were simulated plume concentrations are above the background TDS of 564 mg/ℓ (Figure 37).

It has travelled 210 m directly downstream of the tailings dam, with TDS concentrations above the 1200 mg/ℓ SANS limit, which can be harmful for human consumption. The TDS plume has not reached any community boreholes. The simulated TDS water quality concentration at borehole H12-2361 is less than or equal to 564 mg/ℓ.

Scenario 2b: 10 years post-operational (16 years total) LOM seepage capturing

At 16 years from restart of mining operations (10 years after mining has ceased), the Tailings dam plume has travelled a maximum distance of approximately 525 m directly downstream of the tailings dam, were simulated plume concentrations are above the background TDS of 564 mg/ℓ (Figure 37). It is however in totality much more diluted compared to the Scenario 1 plumes because the seepage capturing boreholes have removed a large volume of the elevated TDS concentration groundwater that seeped from the TSF.

The plume does not have TDS concentrations as high as the SANS limit of 1200 mg/ℓ anymore. Concentrations as high as 1100 mg/ℓ are still found and these are located a maximum distance of 260 m downstream of the tailings dam. The seepage capturing boreholes have successfully pulled back and removed much of the elevated TDS concentration groundwater that seeped from the TSF in only 1 year of pumping post-LOM. Pumping also took place throughout LOM. The TDS plume has not reached any

community boreholes. The simulated TDS water quality concentration at borehole H12-2361 is less than or equal to 564 mg/ℓ.

Scenario 2c: 25 years post operational (31 years total) LOM capturing scenario

At 31 years from restart of mining operations (25 years after mining has ceased), the Tailings dam plume has reached and almost passed the community school borehole H12-2361, and travelled a maximum distance of approximately 890 m directly downstream of the tailings dam, were simulated plume concentrations are above the background TDS of 564 mg/ℓ. Some concentrations behind it have however diluted back to background level (Figure 37).

At this time no TDS concentrations due to planned Smokey Hills mining activities are above the 1200 mg/ℓ SANS limit. The maximum plume concentration is 643 mg/ℓ.

Scenario 2d: 94 yeas post-operational (100 years total) LOM seepage capturing

At 100 years from restart of mining operations (94 years after mining has ceased), the Tailings dam plume has completely been diluted by the fresh groundwater through which it has travelled and all concentrations are approximately at the TDS background concentration. This is evident from the map for Scenario 2d in Figure 37 (bottom right quadrant), where there is no trace of the plume because all TDS concentrations are below 564 mg/ℓ or at that level.

Similarly due to NO3 concentration's natural decay rate, no concentrations of NO3 derived from mining activities are present in the environment at this point in time.

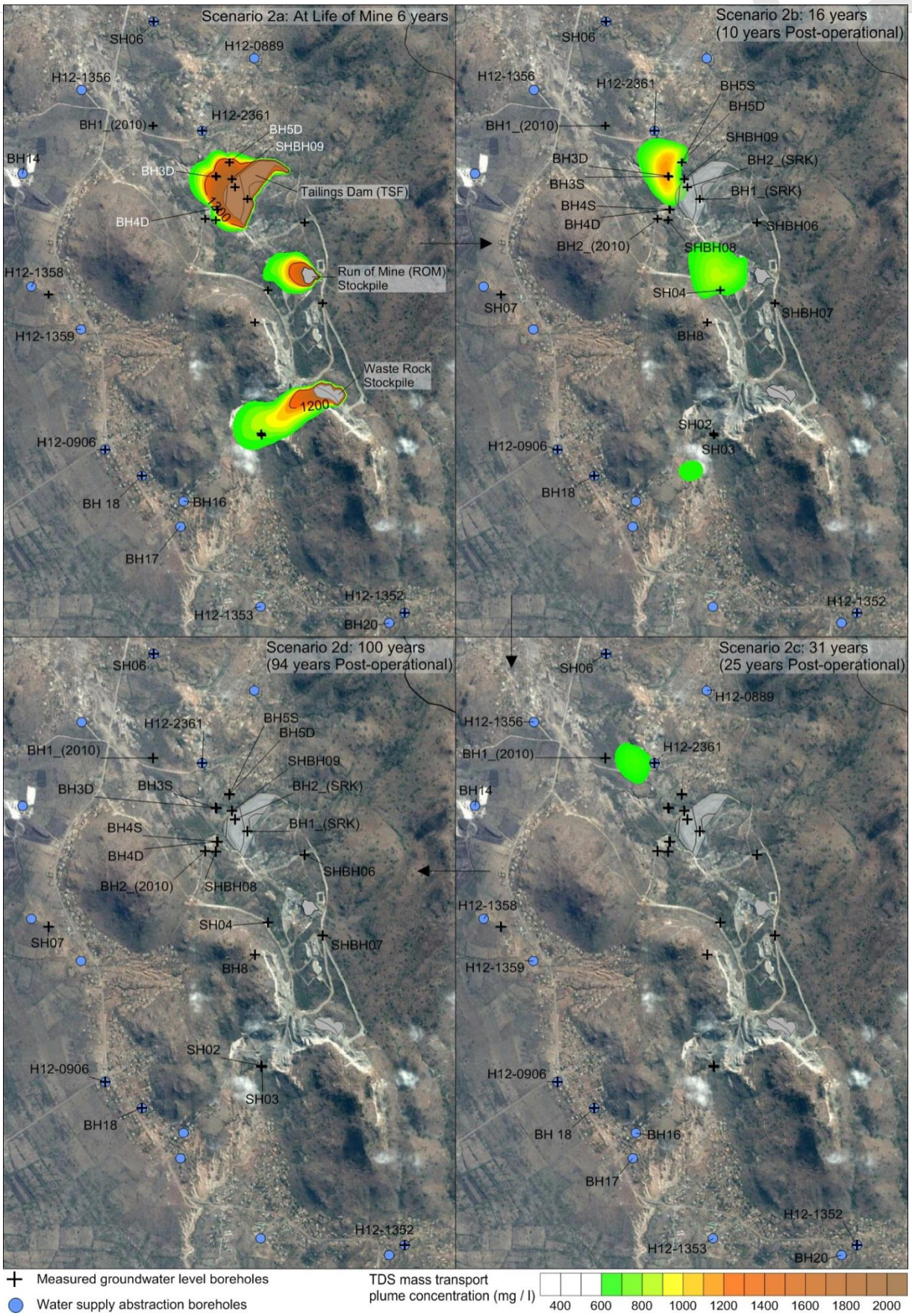

Figure 37 Scenario 2a to 2d: TDS plume mass transport with seepage capturing implemented

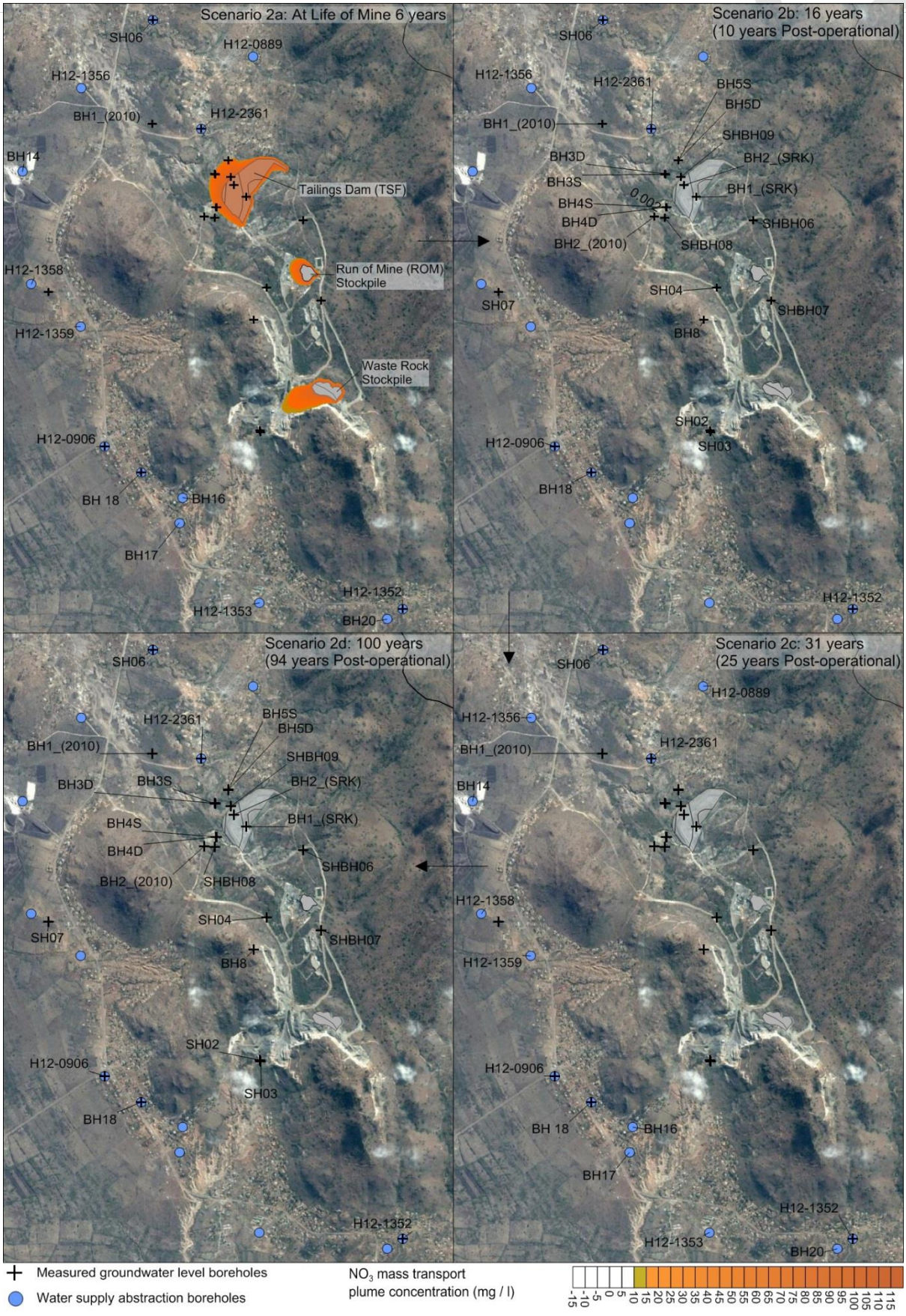

Figure 38 Scenario 2a to 2d: NO3 mass transport plume migration with seepage capturing

Impacts

Possible groundwater impacts associated with proposed new PCDs (also known as storm water dams) development are listed in Table 7.2 and are now characterised using the source-pathway-receptor approach.

Sources

The possible sources of impacts on the receiving groundwater environment are:

1. The proposed pollution control dams (PCDs) and possible increased groundwater recharge to the underlying aquifer, if the PCDs are not lined (unmitigated scenario).

Impacts associated with the PCD as source includes increased groundwater recharge if the PCD is unlined as well as contamination of the underlying aquifer, should the water contained in the PCD be of poor quality. The PCDs are however proposed to be lined.

Pathways

Pathways applicable to the PCD and causal to impacts on the groundwater environment would be a leak in the liner between the water in the PCD and the shallow weathered aquifer or if there was no liner between PCD water and shallow weathered aquifer. From the storm water management plan and current mine planning, the PCDs will be lined. If the PCDs were not lined they would be in direct contact with the unsaturated zone and shallow aquifer groundwater and the mechanism or medium for propagation of change would be water. This assumes that the hydraulic head is shallow enough and that the bottom of the PCD intersects the hydraulic head.

Receptors

The groundwater receptors are:

- The shallow weathered and fractured rock aquifer;
- Possible structures intersected by the PCD;
- Local surface water drainages that feed the downstream clean water system;
- The Communities' potable, irrigation and livestock groundwater supply, if the liner leaks during operational phase, which is a highly unlikely scenario.

17.3. Decommissioning Phase

17.3.1. Ecological Impacts

No further impacts associated with the PCDs are anticipated during the Decommissioning Phase of the Mine. The PCDs will remain as part of the post closure Stormwater management process.

17.3.2. Impacts on Soils

No further impacts associated with the PCDs are anticipated during the Decommissioning Phase of the Mine. The PCDs will remain as part of the post closure Stormwater management process.

17.4. Post Closure Phase

The following impacts could potentially be associated with the post-closure phase of the mine (note that these impacts do not only relate to rehabilitation with regards to the PCDs and/or channels, but ot the closure activities associated with the whole mine):

- **Soil compaction** is likely to occur over much of the rehabilitated area as a consequence of the storage and placement of soil and the change in structure following replacement. The poor soil cover associated with the cleared areas, stockpiles and WRD also renders the site more susceptible to erosion and soil loss. It is probable that these soils will be transferred through the rehabilitated landscape into the draining water courses and receiving water bodies as described earlier. The rehabilitation of the site and decreased surfaces will however still reduce the risk of erosion and sedimentation carried into the wetlands and rivers during the closure phase, compared to the other phases;
- **Spillages:** During the closure phase of the mine the risk of spillages are still pertinent, although the impact will mainly be limited to potential spillages from vehicles. The impact will therefore be greatly reduced as a result of concurrent rehabilitation;
- **Dust generation** can temporarily increase during closure phases of the mine. This is due to rehabilitation activities. During this phase, the impacts should last for a short period. The impact of dust on the vegetation will however be at a reduced intensity during the closure phase compared to the construction and operational phases of the mine as a result of the rehabilitation measures. The revegetation of exposed areas will play a major role in this regard.
- **The control of alien invasive species** will be more pertinent during the closure phase of the mine and the risk of spreading is therefore reduced. Although the movement of vehicles on site during rehabilitation will still have a potential impact on the spreading of alien invasive species, the intensity of spread of alien invasive plants on site is more intense during the operational phase of the mine due to the movement of vehicles over an extended area on and from the site, causing a higher risk of potentially spreading the seeds or vegetative material from invasive species;
- **The impact on fauna mortality** will continue during the closure phase as a result of rehabilitation activities on site.

17.5. Cumulative Impacts

A cumulative impact may result from an additive impact i.e. where it adds to the impact which is caused by other similar impacts or an interactive impact i.e. where a cumulative impact is caused by different impacts that combine to form a new kind of impact. Interactive impacts may either be countervailing (net adverse cumulative impact is less than the sum of the individual impacts) or synergistic (net adverse cumulative impact is greater than the sum of the individual impacts).

The assessment of cumulative impacts on a study area is complex; especially if many of the impacts occur on a much wider scale than the site being assessed and evaluated. It is often difficult to determine at which point the accumulation of many small impacts reaches the point of an undesired or unintended cumulative impact that should be avoided or mitigated. There are often factors which are uncertain when potential cumulative impacts are identified.

The anticipated impacts resulting from the development of the stormwater management infrastructure could potentially result in cumulative effects in the following areas:

- Cumulative impacts on loss and damage to natural habitats if the vegetation is cleared for development.
- Impacts on soils including further topsoil degradation and erosion, compaction, sedimentation, soil pollution and loss of land capability.
- The disturbance of the area could lead to an increase in the growth of alien vegetation.
- Additional risk of soil and water pollution during the construction phase, but during the operational phase it will significantly lower the risk soil and water pollution at the mine site.

18. 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).

Table 20: Mitigation Measures[1]

Nr	Activity	Impact	Without or With Mitigation	Significance	Mitigation Measures	Mitigation Effect
				Magnitude		
Ecology						
Planning Phase						
1	Eradication of protected trees / flora through permit application	Delay of mining onset	WOM	Negligible	Apply and obtain permits from DAFF after liaison with relevant officials and site visit to the area	Can be avoided, managed or mitigated
			WM	Negligible		Can be reversed
Construction Phase						
2	Clearing of vegetation for infrastructure causing direct habitat destruction / fragmentation	Habitat destruction / fragmentation of fauna habitats	WOM	Moderate	· The removal of the isolated indigenous trees and shrubs should only occur on the construction footprint area of the development and not over the larger area. Where possible, vegetation should be retained in between infrastructural elements associated with the project;	May cause irreplaceable loss of resources
			WM	Low	· Conduct flora species search and rescue efforts before ground clearing begins in order to reduce negative impacts on species of concern; • Use existing facilities (e.g., access roads, parking lots, graded areas) to the extent possible to minimize the amount of new disturbance. • Ensure protection of important resources by establishing protective buffers to exclude unintentional disturbance. All possible efforts must be made to ensure as little disturbance as possible to the sensitive habitats such as ravines and moist grassland pockets during construction. • During construction, sensitive habitats must be avoided by construction vehicles and equipment, wherever possible, in order to reduce potential impacts. Only necessary damage must be caused and, for example, unnecessary driving around in the veld or bulldozing natural habitat must not take place. • Construction activities must remain within defined construction areas and the road servitudes. No construction / disturbance will occur outside these areas	Can be avoided, managed or mitigated
3	Topsoil & subsoil stripping, exposure of soils, ore and rock to wind and rain during construction causing erosion and sedimentation	Soil erosion and sedimentation	WOM	Moderate	· Cover disturbed soils as completely as possible, using vegetation or other materials;	May cause irreplaceable loss of resources
			WM	Negligible	· Minimize the amount of land disturbance and develop and implement stringent erosion and dust control practices.	Can be avoided, managed or mitigated
4	Vegetation clearing / vehicle movement	Spreading and establishment of alien invasive species	WOM	Moderate	· Control involves killing the alien invasive plants present, killing the seedlings which emerge, and establishing and managing an alternative plant cover to limit re-growth and re-invasion. The control of these species should even begin prior to the construction phase considering that small populations of the AIS occur around the sites;	May cause irreplaceable loss of resources
			WM	Low	· Institute strict control over materials brought onto site, which should be inspected for seeds of noxious plants and steps taken to eradicate these before transport to the site. Routinely fumigate or spray all materials with appropriate low-residual herbicides prior to transport to site or in a	Can be reversed

[1] **Note that the above mitigation measures are subject to being updated during the EIA phase** subsequent to further and more detailed work being conducted as may be required or as new information becomes available (these being for scoping purposes at present). Monitoring is listed as part of the mitigation measures; however it must be noted that monitoring in itself is not a mitigation measure. Monitoring is important to quantify and verify impacts against pre-development baseline and must be used to pro-actively determine when mitigations should be required.

Nr	Activity	Impact	Without or With	Significance	Mitigation Measures	Mitigation Effect
					quarantine area on site. The contractor is responsible for the control of weeds and invader plants within the construction site for the duration of the construction phase;	
5	Vegetation clearing / vehicle movement	Habitat degradation due to dust	WOM	Moderate	· Daily dampening of dust areas or other dust suppression methods such as dust-aside or more environmentally friendly methods.	May cause irreplaceable loss of resources
			WM	Moderate	· Re-vegetation of impacted areas is to be conducted on an on-going basis.	Can be reversed
6	Heavy machinery and vehicle movement on site	Spillages of harmful substances	WOM	Negligible	· Ensure that mining related waste or spillage and effluent do not affect the sensitive habitat boundaries and associated buffer zones.	May cause irreplaceable loss of resources
			WM	Negligible	· This risk of spillages of reagents and hydrocarbons on the soil during transportation can be reduced with proper maintenance of vehicles. This would include a rigorous and proactive maintenance program	Can be reversed
7	Heavy machinery and vehicle movement on site; Construction of infrastructure, roads etc. on site	Road mortalities of fauna / impact of human activities on site	WOM	Low	· More fauna are normally killed the faster vehicles travel. A speed limit should be enforced (speed on site max 40 km/hour; Outside of the site 80 km/h. In Rain max 40 km/h). It can be considered to install speed bumps in sections where the speed limit tends to be disobeyed. (Speed limits will also lessen the probability of road accidents and their negative consequences).	May cause irreplaceable loss of resources
			WM	Negligible	· Travelling at night should be avoided or limited as much as possible. No travelling at night should be allowed without approval by site manager;	Can be avoided, managed or mitigated
Soils						
Planning Phase						
1	Obtaining of IWUL for crossings (wetland soils) and mining layout on sensitive soils	Delay of mining onset	WOM	Moderate	Apply and obtain IWUL from DWS after liaison with relevant officials and site visit to the area	Can be avoided, managed or mitigated
			WM	Low		Can be reversed
Construction Phase						
2	Heavy machinery and vehicle movement on site	Soil compaction	WOM	Moderate	• Soil should be handled when dry during removal and placement to reduce the risk of compaction; • Vegetation (grass and small shrubs) should not be cleared from the site prior to mining activities or construction (except if vegetation requires relocation as determined through an ecology assessment). This material is to be stripped together with topsoil as it will supplement the organic and possibly seed content of the topsoil stockpile depending on the time of soil stripping (whether plants are in seed or not); and • During construction, sensitive soils with high risk of compaction (e.g. clayey soils) must be avoided by construction vehicles and equipment, wherever possible, in order to reduce potential impacts. Only necessary damage must be caused and, for example, unnecessary driving around in the veld or bulldozing natural habitat must not take place. • Rip and/or scarify all compacted areas. Do not rip and/or scarify areas under wet conditions, as the soil will not loosen. Compacted soil can also be decompacted by “Rotary Decompactors” to effectively aerate soils for vegetation establishment.	May cause irreplaceable loss of resources
			WM	Negligible		Can be reversed
3	Topsoil & subsoil stripping, exposure of soils, ore and rock to wind and rain during construction causing erosion and sedimentation in wetlands	Soil erosion and sedimentation	WOM	Moderate	• When possible, topsoil stripping and excavation activities should be scheduled for the low rainfall season (winter); • Cover disturbed soils as completely as possible, using vegetation or other materials; • Minimize the amount of land disturbance and develop and implement stringent erosion and dust control practices. • Sediment trapping, erosion and storm water control should be addressed by a hydrological engineer in a detailed storm water management plan; • All aspects related to dust and air quality should be addressed by an air quality specialist in a specialist report;	May cause irreplaceable loss of resources
			WM	Low		Can be avoided, managed or mitigated

Nr	Activity	Impact	Without or With	Significance	Mitigation Measures	Mitigation Effect
					• Protect sloping areas and drainage channel banks that are susceptible to erosion and ensure that there is no undue soil erosion resultant from activities within and adjacent to the construction camp and Work Areas; • Repair all erosion damage as soon as possible to allow for sufficient rehabilitation growth; • Gravel roads must be well drained in order to limit soil erosion;	
4	Heavy machinery and vehicle movement on site	Spillages of harmful substances	WOM	Low	• Ensure that mining related waste or spillage and effluent do not affect the sensitive habitat boundaries and associated buffer zones. • This risk of spillages of reagents and hydrocarbons on the soil during transportation can be reduced with proper maintenance of vehicles. This would include a rigorous and proactive maintenance program • This risk can be further reduced through an adequate program of training of drivers and crews. This would include defensive driver training, basic vehicle maintenance, and emergency control of spills. In order for the vehicle crews to be adequately able to control any spills at an early stage, the vehicles must be properly equipped with spill containment equipment (booms, sandbags, spades, absorbent pads, etc.). Responsibility for training lies with the transport contractor. Adequate training, maintenance, and equipment of transport crews should be included as a requirement for transport contracts. • The hydrochloric acid tanks are contained within an epoxy-coated, concrete lined and bermed facility that has been designed to contain 110% of the volume of the tanks in the event of a spill. This eliminates the potential impacts to soils from spills of hydrochloric acid. • Spills from the tailings thickener will flow by gravity to the mine reclaim water ponds at the southern toe of the existing fines residue deposit. From there they will be pumped back to the processing plant. The area that would be affected by such a spill has already been impacted by the mining operation. • All employees will be trained in cleaning up of a spillage. The necessary spill kits containing the correct equipment to clean up spills will be made available at strategic points in the plant area.	May cause irreplaceable loss of resources
			WM	Negligible		Can be reversed
5	Topsoil & subsoil stripping	Soil destruction and sterilization	WOM	Moderate	• No specific mitigation can be applied during the construction phase of the mine to prevent soil destruction, although an important measures should be the correct handling and stockpiling of topsoil	May cause irreplaceable loss of resources
			WM	Low		Can be reversed
6	Topsoil & subsoil stripping, Clearing of vegetation through wetlands and water courses for road crossings	Loss of land capability	WOM	Moderate	No specific mitigation can be applied during the construction phase itself to prevent loss of land capability considering that the land use will change to industrial. This however, does not prevent the mine from ensuring that disturbance and clearing should be confined to the footprint areas of the mine and not over the larger area. This can be done in the following ways: • Corridors should be secured around the mining footprint areas to ensure the current land use (grazing) can continue in a functional way during mining. • Clearly demarcate the entire development footprint prior to initial site clearance and prevent construction personnel from leaving the demarcated area. This could be done through the fencing off the entire development footprint and institute strict access control to the portions of the owner-controlled property that are to remain undisturbed as soon as possible after initial site clearance. The fence should preferably be impermeable (for example a solid wall) to discourage invertebrates and small animals from entering the site. [Normally solid perimeter walls are not recommended in order to facilitate the movement of invertebrates, but in this case restriction of their movement into the area will be advantageous.] • All development activities should be restricted to specific recommended areas and strict buffer zones should be applied around the sensitive areas. The Environment Control Officer (ECO) should demarcate and control these areas. Unnecessary bulldozing through the veld should be avoided.	May cause irreplaceable loss of resources
			WM	Low		Can be reversed

Nr	Activity	Impact	Without or With	Significance	Mitigation Measures	Mitigation Effect
Heritage						
Planning Phase						
1	Planning	Site EXIGO-SHP-FT01 (low significance)	WOM	Negligible	Site monitoring by ECO.	Can be avoided, managed or mitigated
			WM	Negligible		Can be avoided, managed or mitigated
2	Planning	Site EXIGO-SHP-FT02 (high significance)	WOM	Negligible	Avoidance, site function identification, site monitoring by ECO	Can be avoided, managed or mitigated
			WM	Negligible		Can be avoided, managed or mitigated
Hydrogeology						
Operational Phase						
1	Construction and operation of Pollution Control Dam (PCD)	Alteration of natural topography and drainage patterns	**WOM**	Low	The PCDs are constructed for the operational phase and will remain on site. This is actually a positive impact from the social and community as the dams will only contain fresh water and be available to the community for recreation and cattle watering or irrigation. Thus no mitigation required. During construction phase, adequate storm water management must be practiced, i.e. channelling of water so that increased suspended solids water during flood do not contaminate downstream clean water sources.	Can be reversed
			WM	Negligible		Can be reversed
2	Construction and operation of Pollution Control Dam (PCD)	Alteration of runoff and surface water volumes reaching downstream surface water system/water bodies	**WOM**	Moderate	Mitigation measure 1: During the operational phase the affected mining surface area will be minimised to maximise natural runoff and minimise mine ("dirty") water runoff that will be captured and stored by the PCD. Channels will be created to allow as much clean water runoff to be diverted around the PCD and mining area in order for the clean water runoff to still reach the downstream destined drainages and surface water bodies. Post-operational: Once the mining site has been cleaned runoff from the PCDs (which are now clean water dams) and storage will be a positive impact.	Can be reversed
			WM	Low		Can be reversed
3	Construction and operation of Pollution Control Dam (PCD)	Increased recharge due to permanent ponding of water on underlying soil and weathered rock	**WOM**	Low	Mitigation measure 1: This impact will probably occur if the PCD is not lined, but the PCDs will be lined. Recharge of the PCD water is not necessarily negative unless PCD water is of poor quality. In the case of the PCD water being of acceptable drinking water quality, this impact will be positive. The PCD water quality should be monitored bi-annually, or if required quarterly. In Post-operational phase the PCD will become normal clean water dams, thus they will provide water storage dams for the communities and for e.g. for livestock watering.	Can be reversed
			WM	Low		Can be reversed
4	Groundwater and surface water monitoring: Failure to adhere to monitoring and maintenance requirements	Prolonged contamination of groundwater and surface water, erosion	**WOM**	Low	Mitigation measure 1: Monitoring should be performed. Process water should be properly contained in process water pipes, channels and storage facilities and the infrastructure regularly inspected and maintained if required. Process water should be treated to an acceptable quality if the goal is for it to be released or it should be removed by professional hazardous waste contractors and stored and disposed of in a manner that is in line with environmental legislation.	Can be avoided, managed or mitigated
			WM	Negligible		Can be avoided, managed or mitigated
5	Groundwater and surface water monitoring: Failure to adhere to monitoring and maintenance requirements	No indication of how to manage process water infiltration into groundwater	**WOM**	Moderate		Can be avoided, managed or mitigated
			WM	Negligible	Mitigation measure 1: Same as mitigation measure 1 for impact 3.1. A mine water balance should also be in place and implemented.	Can be avoided, managed or mitigated

Nr	Activity	Impact	Without or With	Significance	Mitigation Measures	Mitigation Effect
6	Storm water management	Flooding of the processing plant and surrounding land uses	WOM	Low	Mitigation measure 1: A storm water management plan should be put in place and its recommendations and designs implemented where required and feasible.	Can be avoided, managed or mitigated
			WM	Negligible		Can be avoided, managed or mitigated

19. MOTIVATION WHERE NO ALTERNATIVE SITES WERE CONSIDERED.

Refer to Section 8 for alternatives considered. Alternatives with regards to stormwater management design and placement of pollution control dams were considered.

20. STATEMENT MOTIVATING THE ALTERNATIVE DEVELOPMENT LOCATION WITHIN THE OVERALL SITE.

(Provide a statement motivation the final site layout that is proposed)

The mine is already existing therefore the following alternatives were considered. Refer to Section 8.2.

In summary, the following alternatives were considered:

- **Site Alternatives for PCD2:**
  - Alternative 1 - location within drainage line
  - Alternative 2 - located next to drainage line **(preferred)**
- **Design Alternatives for Stormwater Management:**
  - Existing Tailings Dam pool to be used for storm water containment.
  - Separate Pollution Control Dam (PCD2) to be constructed **(preferred)**
- **The "no-go" alternative**

If the PCD's are not developed this will result in negative impacts on water quality as the existing dirty water management infrastructure will not be sufficient to prevent the release of dirty water in the future. The No-Go alternative is therefore rejected.

For more information refer to Section 8.2 above.

21. 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)

Refer to EIA methodology in Section 16 and Table 21 below in section 22.

22. 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 21: Potential Impact and Mitigation Type to be implemented

Nr	Activity	Impact	Without or With Mitigation	Significance	Mitigation Type
				Magnitude	
Ecology					
Planning Phase					
1	Eradication of protected trees / flora through permit application	Delay of mining onset	WOM	Negligible	Timely application for permits
			WM	Negligible	
Construction Phase					
2	Clearing of vegetation for infrastructure causing direct habitat destruction / fragmentation	Habitat destruction / fragmentation of fauna habitats	WOM	Moderate	Control through access and footprint management
			WM	Low	
3	Topsoil & subsoil stripping, exposure of soils, ore and rock to wind and rain during construction causing erosion and sedimentation	Soil erosion and sedimentation	WOM	Moderate	Control through access and footprint management
			WM	Negligible	
4	Vegetation clearing / vehicle movement	Spreading and establishment of alien invasive species	WOM	Moderate	Control of materials brought onto site
			WM	Low	
5	Vegetation clearing / vehicle movement	Habitat degradation due to dust	WOM	Moderate	Control through dust

			WM	Moderate	suppression
6	Heavy machinery and vehicle movement on site	Spillages of harmful substances	WOM	Negligible	Prevention of spillages
			WM	Negligible	
7	Heavy machinery and vehicle movement on site; Construction of infrastructure, roads etc. on site	Road mortalities of fauna / impact of human activities on site	WOM	Low	Control of speed limits
			WM	Negligible	
Soils					
Planning Phase					
1	Obtaining of IWUL for crossings (wetland soils) and mining layout on sensitive soils	Delay of mining onset	WOM	Moderate	Control through timely application of license
			WM	Low	
Construction Phase					
2	Heavy machinery and vehicle movement on site	Soil compaction	WOM	Moderate	Control through prevention and rehabilitation
			WM	Negligible	
3	Topsoil & subsoil stripping, exposure of soils, ore and rock to wind and rain during construction causing erosion and sedimentation in wetlands	Soil erosion and sedimentation	WOM	Moderate	Remedy through rehabilitation, revegetation and stabilisation
			WM	Low	
4	Heavy machinery and vehicle movement on site	Spillages of harmful substances	WOM	Low	Control through vehicle maintenance
			WM	Negligible	
5	Topsoil & subsoil stripping	Soil destruction and sterilization	WOM	Moderate	Control through correct

			WM	Low	handling and stockpiling of topsoil
6	Topsoil & subsoil stripping, Clearing of vegetation through wetlands and water courses for road crossings	Loss of land capability	WOM	Moderate	Control through access and footprint management
			WM	Low	
Heritage					
Planning Phase					
1	Planning	Site EXIGO-SHP-FT01 (low significance)	WOM	Negligible	Site monitoring by ECO.
			WM	Negligible	
2	Planning	Site EXIGO-SHP-FT02 (high significance)	WOM	Negligible	Avoidance, site function identification, site monitoring by ECO
			WM	Negligible	
Hydrogeology					
Operational Phase					
1	Construction and operation of Pollution Control Dam (PCD)	Alteration of natural topography and drainage patterns	**WOM**	Low	Control through stormwater management
			WM	Negligible	
2	Construction and operation of Pollution Control Dam (PCD)	Alteration of runoff and surface water volumes reaching downstream surface water system/water bodies	**WOM**	Moderate	Control through stormwater management
			WM	Low	

3	Construction and operation of Pollution Control Dam (PCD)	Increased recharge due to permanent ponding of water on underlying soil and weathered rock	**WOM**	Low	Management and monitoring of groundwater and surface water
			WM	Low	
4	Groundwater and surface water monitoring: Failure to adhere to monitoring and maintenance requirements	Prolonged contamination of groundwater and surface water, erosion	**WOM**	Low	Management and monitoring of groundwater and surface water
			WM	Negligible	
5	Groundwater and surface water monitoring: Failure to adhere to monitoring and maintenance requirements	No indication of how to manage process water infiltration into groundwater	**WOM**	Moderate	Management and monitoring of groundwater and surface water
			WM	Negligible	
6	Storm water management	Flooding of the processing plant and surrounding land uses	**WOM**	Low	Control through stormwater management
			WM	Negligible	

The supporting impact assessment conducted by the EAP in included in Table 19.

23. 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 22: Specialist recommendations

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.
Land Use & Soil Potential Assessment	• The density of the vegetation and grazing capacity of the land would allow grazing of the area, especially on the larger farm portions that can sustain economically viable grazing. The proposed PCD development will cause a loss of grazing value of the land, although site specific mitigation needs to be implemented. • The land capability of the site is mostly restricted to wildlife grazing due to the shallow and often sandy nature of the soils and location of pockets of seasonally wet soils in some areas. The potential impacts associated with the proposed development are soil disturbance (erosion, compaction), loss of land capability, soil destruction and sterilisation and soil pollution (spillages). • The site should subsequently be considered as being limited value grazing land with low potential for arable agriculture considering the climatic conditions and shallow soils. • Mitigation measures are provided in the report for the impacts and provided this management and rehabilitation measures stipulated in the report are strictly adhered to, the PCD development could be supported.	X	Refer to Table 24 and Appendix 7.3: Soils, Agricultural Potential and Land Capability Assessment
Ecological and Wetland Impact Assessment	The proposed construction of the PCDs that form part of the Smokey Hills Mining site will definitely impact on the flora and fauna of the area. The following can be concluded with regards to the impacts: • Vegetation clearing and topsoil stripping will have the most definite and permanent direct negative impact on the flora and fauna of the area during the construction phase of the dams. The clearance will eradicate all vegetation and displace fauna that will migrate to neighbouring areas; • The indirect impacts such as soil erosion, fauna mortalities, spillages and establishment of alien invasive species are relevant for the PCD construction, although with strict	X	Refer to Table 24 and Appendix 7.2: Ecological and Wetland Impact Assessment

	implemented of the mitigation measures and action plans for the various components, the impacts can be minimized; • Considering the cumulative impacts of the PCD construction on the fauna and flora of the area, it can be concluded that the current degraded state of the vegetation and fauna habitats caused by the surrounding and on site mining activities, will cause some negative impacts, although the implementation of a rehabilitation and revegetation plan will allow the vegetation to recover over time and the fauna to return to the area; • The PCD development can be considered as viable, although strict mitigation and monitoring will need to be implemented throughout all of the mining phases to ensure the impacts are kept to a minimum.		
Archaeological Impact Assessment	No heritage resources were documented within the proposed Smokey Hills Pollution Control Dams project footprints. It is the opinion of the author of this Archaeological Impact Assessment Report that the proposed Smokey Hills Pollution Control Dams may proceed from a culture resources management perspective, provided that no previously undetected heritage remains are found at any point in construction and operational phases.	X	Refer to this table and Appendix 7.1: Archaeological Impact Assessment
Hydrogeological Impact Assessment	The following recommendations were formulated from the study: • It is recommended that the proposed PCD1 Alternative A (PCD1a) location on the TSF should be the preferred location for the PCD associated with the processing plant. • Based on the groundwater quality monitoring results over the past two years there seems to be a localised increase in nitrate (NO3) in the aquifer at SH02 and SH03. It is thought that the source of NO3 is spent explosives used in the blasting during mining. NO3 should be carefully monitored going forward to determine if there is a contamination plume migrating downstream of the open cast sections. • Currently there are not any monitoring boreholes close to the open cast pits and underground mining area on Hill 2 or Hill 3. It is recommended that at least one monitoring borehole, ±50-120 m deep be drilled at each hill depending on groundwater level depth encountered, close to the open cast areas. Alternatively one borehole in the saddle of Hill 2 and Hill 3. This borehole(s) can be drilled when the mine has been running for ± 6 months in order for the mine to be able to finance the drilling costs. • Based on numerical flow model and mass transport results from this investigation, seepage capturing boreholes will have to be equipped downstream in order to capture the contamination plume migrating from the tailings dam through the shallow weathered and alluvial aquifer. At least one suitable seepage capturing borehole has already been drilled during this investigation, numbered SHBH09. This borehole currently doubles as a groundwater monitoring borehole and has been equipped with protective borehole cap. • Based on mass (contaminant) transport results from this study's numerical model and existing intact seepage capturing boreholes, abstraction from seepage capturing boreholes will be required during the operational phase and ± 1 year post-closure to completely mitigate the TDS contamination risk at the school borehole H12-2361. Four existing intact boreholes were used and simulated as seepage capturing boreholes abstracting in the model during LOM and capturing evaluated thereafter (Scenario 3). • It is recommended that when the mine is in operation again for approximately 6 months,	X	Refer to this table and Appendix 7.5: Hydrogeological Impact Assessment

	that two water samples be taken from 1) the tailings dam penstock sump water after a 2-hour purging; and 2) from the process water (tailings liquor) on top of the tailings dam or in the process water circuit, during a water quality monitoring run. These samples only have to can be analysed for the normal range of monitoring constituents including TDS and NO3. • It is recommended that a sample be taken of the rain water in a clean mineral water bottle during the rainy season and provided to the monitoring team during their next sampling run at the mine. This task can be performed by the mining staff, as long as the water is not cross-contaminated by other water or solutions. Only chloride (Cl) has to be analysed for at the lab from this sample, which is a relatively inexpensive (R70) analysis. This will assist in better estimating the groundwater recharge for the site with the chloride method.		
Closure Provision and Rehabilitation Plan	Based on the closure plan described above it is recommended that the following actions be taken in order to ensure adherence to the closure plan objectives: • All uncertainties are to be included in the report and reflected in an updated financial provision as soon as the information becomes available; • The mine should confirm the location and availability of topsoil for rehabilitation purposes outside the mining area as it is estimated that there will be a shortfall when rehabilitation processes commences. This cost is not included in current calculation processes; and • Progressive rehabilitation to be addressed and areas which can be rehabilitated should be started with as soon as practically possible. It is important to ensure that funds for progressive rehabilitation are made available as part of the annual operational budgets and these actions should be scheduled. It is recommended that a progressive rehabilitation plan be implemented with the help of a closure specialist.	X	Refer to this table and Appendix 7.6: Rehabilitation, Decommissioning and Mine Closure Plan

Attach copies of Specialist Reports as appendices
Refer to Appendix 7: Specialist Reports

24. ENVIRONMENTAL IMPACT STATEMENT

24.1. SUMMARY OF THE KEY FINDINGS OF THE ENVIRONMENTAL IMPACT ASSESSMENT

The findings of the specialist studies undertaken within this EIA&EMPR provide an assessment of both the benefits and potential negative impacts anticipated as a result of the proposed project. The findings conclude that, provided that the recommended mitigation and management measures are implemented, there are no environmental fatal flaws that should prevent the proposed project from proceeding.

In order to achieve appropriate environmental management standards and ensure that the findings of the environmental studies are implemented through practical measures, the recommendations from this EIA&EMPR will form part of the contract with the contractors appointed to construct and maintain the proposed mine and associated infrastructure. The EIA&EMPR would be used to ensure compliance with environmental specifications and management measures. The implementation of this EIA&EMPR for key cycle phases (i.e. construction, operation and closure/decommissioning) of the proposed project is considered to be fundamental in achieving the appropriate environmental management standards as detailed for this project.

24.2. 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

Refer to Appendix 4: Site Plan

24.3. SUMMARY OF THE POSITIVE AND NEGATIVE IMPLICATIONS AND RISKS OF THE PROPOSED ACTIVITY AND IDENTIFIED ALTERNATIVES

Refer to Section 15 and Section 22.

25. 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.

1 Specialist recommendations which could be included as conditions have been discussed in Table 22.

2 Specialist management measures as well as the significance of the impacts prior and post mitigation are provided in Section 15 and contained in the respective studies.

26. 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)

Refer to section 8.

27. ASPECTS FOR INCLUSION AS CONDITIONS OF AUTHORISATION

Any aspects which have not formed part of the EMPr that must be made conditions of the Environmental Authorisation

- Refer to Table 22 for conditions which could possibly be included in the Environmental Authorisation.

28. DESCRIPTION OF ANY ASSUMPTIONS, UNCERTAINTIES AND GAPS IN KNOWLEDGE

(Which relate to the assessment and mitigation measures proposed)

Assumptions and limitations applicable to specific **to** the assessment process and mitigation measures proposed in specific specialist studies include the following:

- **Land Use & Soil Potential**
  - In order to obtain a comprehensive understanding of the dynamics of the soils of the study area, surveys should ideally be replicated over several seasons and over a number of years. However, due to project time constraints such long-term studies are not feasible;
  - The large study area did not allow for the finer level of assessment that can be obtained in smaller study areas. Therefore, data collection in this study relied heavily on data from representative, homogenous sections of soils, as well as general observations, aerial photograph analysis, generic data and a desktop analysis.
- **Ecological**
  - In order to obtain a comprehensive understanding of the dynamics of the flora and fauna of the study area, surveys should ideally be replicated over several seasons and over a number of years. However, due to project time constraints such long-term studies are not feasible and this floral study was conducted over two seasons;

- The large study area did not allow for the finer level of assessment that can be obtained in smaller study areas. Therefore, data collection in this study relied heavily on data from representative, homogenous sections of vegetation units, as well as general observations, aerial photograph analysis, generic data and a desktop analysis;
- Visibility proved to be a constraint in encroached areas where plant species might have been missed beneath the densely overgrown and obstructed by surface vegetation;
- This report focuses only on the water courses and riparian areas at the proposed development footprints. Other wetland areas further away from the proposed road was not assessed.
- Thus, even though it might be assumed that survey findings are representative of the ecosystem of the project area, it should be stated that the possibility exists that individual plants species might have been missed due to the nature of the terrain (dense vegetation). Therefore, maintaining due cognisance of the integrity and accuracy of the ecological survey, it should be stated that the ecological resources identified during the study do not necessarily represent all the ecological resources present on the property.

- **Archaeological**
  - The pedestrian site survey for the project primarily focused around areas tentatively identified as sensitive and of high heritage probability (i.e. those noted during the aerial survey) as well as areas of high human settlement catchment. The following constraints were encountered:

    - **Visibility:** Visibility proved to be a minor constrain in areas with denser surface cover as well as portions where vegetation is more pristine.

    Thus, even though it might be assumed that survey findings are representative of the heritage landscape of the project area for the Smokey Hills Pollution Control Dams Project, it should be stated that the possibility exists that individual sites could be missed due to the localised nature of some heritage remains as well as the possible presence of sub-surface archaeology. Therefore, maintaining due cognisance of the integrity and accuracy of the archaeological survey, it should be stated that the heritage resources identified during the study do not necessarily represent all the heritage resources present in the project area. The subterranean nature of some archaeological sites, dense vegetation cover and visibility constraints sometimes distort heritage representations and any additional heritage resources located during consequent development phases must be reported to the Heritage Resources Authority or an archaeological specialist.

- **Wetland**
  - The large study area did not allow for the finer level of assessment that can be obtained in smaller study areas. Therefore, data collection in this study relied heavily on data from representative sections, as well as general observations and a desktop analysis.
- **Hydrogeological**

The following assumptions were made for the numerical groundwater model:

1. Complete information regarding the exact Life of Mine (LOM) was not available. Based on discussions with the client and environmental team, a LOM of 6 years was assumed for mass transport simulation purposes in the model.
2. The alluvial aquifer in the valley areas as indicated by the 1: 250 000 geology map is assumed to be pervasive, i.e. it does not form isolated pockets of deeper alluvium.
3. The mean concentrations calculated from the existing sampled and mine monitoring boreholes were assumed to be representative of the mean concentrations across the model domain for mass transport simulation purposes.
4. The alluvial aquifer was assumed to have a thickness of 10 m in the valley and be absent in the mountainous areas, according to the 1: 250 000 geology map.
5. The weathered and fractured bedrock (weathered zone) aquifer is assumed to be 10 m in thickness.
6. For the purposes of the model, the fresh hard rock norite, anorthosite and pyroxenite aquitard was assumed to be 100 m in thickness.

When assumptions were made or reference values used, a conservative approach was followed.

- **Closure and Rehabilitation**
  - All costs referred to excludes Value Added Tax;
  - The closure period will commence once the last ton of ore has been extracted although concurrent rehabilitation will take place (Roll-over mining);
  - All runoff and process water will be recycled;
  - It is assumed that all dumped material not properly rehabilitated during operation will be reshaped to a 1:3 slope to be sustainable in the long term;

- It was further assumed that berms and/or storm water retention dams will be required for storm water management during operations as well as to minimize the risk associated with inadvertent access to the pit.
- No engineering and/or specific closure designs were done as part of the closure liability determination process; and
- The financial provision required was calculated according to the criteria as set out in the official Mine Closure Quantum Guideline document (DME, 2005). As per the Mine Closure Quantum Guideline, specific weighing factors have been taken into account in these calculations.

29. REASONED OPINION AS TO WHETHER THE PROPOSED ACTIVITY SHOULD OR SHOULD NOT BE AUTHORISED

29.1. REASONS WHY THE ACTIVITY SHOULD BE AUTHORIZED OR NOT

Please refer to section 24.1. The findings of the specialist studies undertaken within this EIA&EMPR provide an assessment of both the benefits and potential negative impacts anticipated as a result of the proposed project. The findings conclude that, provided that the recommended mitigation and management measures are implemented, there are no environmental fatal flaws that post the provided mitigation, should prevent the proposed project from proceeding.

The Department of Water and Sanitation (DWS) requires the mine's to separate clean and dirty storm water under Regulation GN704. On-going consultations with DWS have confirmed the DWS requirements to implement measures for the more effective management of storm water and pollution control at Smokey Hills Mine. This will improve both the protection of the environment and water resources.

30. CONDITIONS THAT MUST BE INCLUDED IN THE AUTHORISATION

30.1. SPECIFIC CONDITIONS TO BE INCLUDED INTO THE COMPILATION AND APPROVAL OF EMPR

Please refer to section 27.

30.2. REHABILITATION REQUIREMENTS

For the mining operations, the following closure objectives and goals are proposed:

- To rehabilitate all disturbed land to a state that is suitable for its post closure use;
- To ensure that affected areas are safe and secure for both human and animal activities;
- The physical and chemical stability of the remaining structures should be such that risk to

the environment through naturally occurring forces is eliminated;

- To rehabilitate all disturbed land to a state where limited or preferably no post closure management is required;
- To rehabilitate all disturbed land to a state that facilitates compliance with current environmental quality objectives (air and water quality); and
- To limit the impact on personnel whose positions may become redundant on decommissioning of the mine

Refer to section 6 of Appendix 7.6: Rehabilitation, Decommissioning and Mine Closure Plan.

31. PERIOD FOR WHICH THE ENVIRONMENTAL AUTHORISATION IS REQUIRED.

The current life of mine (LoM) is expected to be circa 6 years once the mine comes out of care and maintenance.

32. 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.

Please refer to section 38 of Part B.

33. FINANCIAL PROVISION

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

The provision for closure required for the proposed open pit extension and the existing mining activities combined will create a shortfall of R 90 950 in the established fund that will be provided.

Refer to Section 37.10 for more information.

33.1. EXPLAIN HOW THE AFORESAID AMOUNT WAS DERIVED.

The financial provision was calculated according to the criteria as set out in section 9 of the Final Rehabilitation, Decommissioning and Mine Closure Plan using the DMR's Mine Closure Quantum Guideline document. Refer to section 10 of Appendix 7.6: Rehabilitation, Decommissioning and Mine Closure Plan.

33.2. 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).

Agreed.

34. DEVIATIONS FROM THE APPROVED SCOPING REPORT AND PLAN OF STUDY

34.1. DEVIATIONS FROM THE METHODOLOGY USED IN DETERMINING THE SIGNIFICANCE OF POTENTIAL ENVIRONMENTAL IMPACTS AND RISKS

(Provide a list of activities in respect of which the approved scoping report was deviated from, the reference in this report identifying where the deviation was made, and a brief description of the extent of the deviation).

No deviations to the methodology for determining significance occurred. Refer to Section 37.2 below for specialist studies conducted.

34.2. MOTIVATION FOR THE DEVIATION

Not applicable.

35. OTHER INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

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

35.1.1. 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 7 and confirm that the applicable mitigation is reflected in Table 20.herein).

The project involves the construction of new pollution control dams and therefore does not have a significant impact on the socio-economic conditions. Temporary jobs will be created which will have a low positive impact on the socio-economic conditions, however a number of skilled labourers might be employed contrary to community expectations and might create tension and hostility from community members. The project will have a positive impact on the water quality of the project area which is a positive impact for the surrounding communities.

35.1.2. 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 8 and confirm that the applicable mitigation is reflected in Table 17.herein).

Previous studies conducted in the Steelpoort region suggest a rich and diverse archaeological landscape but the surroundings of the proposed Pollution Control Dams Project areas have been transformed by mining, prospecting and related developments. Cognisance should nonetheless be taken of archaeological material that might be present in surface and sub-surface deposits along drainage lines and in pristine areas.

No heritage resources were documented within the proposed Smokey Hills Pollution Control Dams project footprints. It is the opinion of the author of the Archaeological Impact Assessment Report (Appendix 7.2) that the proposed Smokey Hills Pollution Control Dams may proceed from a culture resources management perspective, provided that no previously undetected heritage remains are found at any point in construction and operational phases.

Archaeology

The study did not identify any archaeological receptors which will be directly impacted by the proposed project. Maandagshoek is situated in a rich archaeological landscape with Stone Age and Iron Age remnants occurring throughout. However, no impact on archaeological sites or features is anticipated.

Built Environment

The study has not identified any buildings which will be directly impacted by the proposed project. In terms of the larger mining property, the general landscape has low significance in terms of the built environment as there are no apparent old buildings, structures, or features, old equipment, public memorial or monuments present. No impact on the built environment is therefore anticipated.

Cultural Landscape

Even though the larger Steelpoort area comprises a rich cultural landscape, the landscape surrounding the proposed project areas has been transformed by mining, human settlement and agriculture. Further away from the project area, the landscape is typical of Sekhukhune, with large areas of undulating hills, large mountains to the south and north and flatter plains in-between. This landscape stretches over many kilometres and the proposed project is unlikely to result in a significant impact on the landscape.

Graves / Human Burials Sites

No human burials were identified during the study. In the rural areas of the Limpopo Province graves and cemeteries often occur within settlements or around homesteads but they are also randomly scattered around archaeological and historical settlements. The probability of additional and informal human burials encountered during development should thus not be excluded. In addition, human remains and burials are commonly found close to archaeological sites; they may be found in "lost" graveyards, or occur sporadically anywhere as a result of prehistoric activity, victims of conflict or crime. It is often difficult to detect the presence of

archaeological human remains on the landscape as these burials, in most cases, are not marked at the surface. Human remains are usually observed when they are exposed through erosion. In some instances packed stones or rocks may indicate the presence of informal pre-colonial burials. If any human bones are found during the course of construction work then they should be reported to an archaeologist and work in the immediate vicinity should cease until the appropriate actions have been carried out by the archaeologist. Where human remains are part of a burial they would need to be exhumed under a permit from either SAHRA (for pre-colonial burials as well as burials later than about AD 1500). Should any unmarked human burials/remains be found during the course of construction, work in the immediate vicinity should cease and the find must immediately be reported to the archaeologist, or the South African Heritage Resources Agency (SAHRA). Under no circumstances may burials be disturbed or removed until such time as necessary statutory procedures required for grave relocation have been met.

36. 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)**.

Please refer to the Alternatives Assessment in Section 8.2.

PART B

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

37. DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME

37.1. 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)

Refer to Sections 1.1 and 1.2.

37.2. 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)

Key aspects identified by the EAP (Exigo) and specialists that was assessed by specialist studies as part of the EIA include:

- Heritage aspects
- Ecological aspect (Fauna, Flora and wetlands)
- Impact on soils, land use, land capability and agricultural potential
- Groundwater aspects
- Financial Provision for Closure

Also refer to section 15 and Table 19 in Part A.

Specialist studies conducted when the opencast development was still proposed, but that was excluded from this report due to the reduced scope and subsequent impacts on the environment include the following:

- Social Impact Assessment
- Air Quality Impact Assessment
- Noise Impact Assessment
- Visual Impact Assessment
- Blasting and vibration Impact Assessment

37.3. 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)

Refer to Appendix 4: Site Plan

37.4. DESCRIPTION OF IMPACT MANAGEMENT OBJECTIVES INCLUDING MANAGEMENT STATEMENTS

37.4.1. DETERMINATION OF CLOSURE OBJECTIVES (ensure that the closure objectives are informed by the type of environment described in 2.4 herein)

- To rehabilitate all disturbed land to a state that is suitable for its post closure use;
- To ensure that affected areas are safe and secure for both human and animal activities;
- The physical and chemical stability of the remaining structures should be such that risk to the environment through naturally occurring forces is eliminated;
- To rehabilitate all disturbed land to a state where limited or preferably no post closure management is required;
- To rehabilitate all disturbed land to a state that facilitates compliance with current environmental quality objectives (air and water quality); and
- To limit the impact on personnel whose positions may become redundant on decommissioning of the mine.

37.4.2. THE PROCESS FOR MANAGING ANY ENVIRONMENTAL DAMAGE, POLLUTION, PUMPING AND TREATMENT OF EXTRANEOUS WATER OR ECOLOGICAL DEGRADATION AS A RESULT OF UNDERTAKING A LISTED ACTIVITY

Refer to Table 24 for the proposed mitigation measures.

37.4.3. POTENTIAL RISK OF ACID MINE DRAINAGE

(indicate whether or not the mining can result in acid mine drainage)

There is no risk for acid rock drainage (ARD) at the mine as the sulphide content is insignificantly low with very low sulphide generating potential. Refer to the section directly below for more information. Furthermore, the proposed project is a stormwater upgrade project and the underground mining activities were already approved as part of the 2007 EMPR.

37.4.4. STEPS TAKEN TO INVESTIGATE, ASSESS, AND EVALUATE THE IMPACT OF ACID MINE DRAINAGE.

Eight geochemical samples were submitted to UIS Analytical Services laboratory for selected geochemical analyses. Six of the samples were taken from different representative locations on the tailings storage facility (TSF). Two samples were taken at representative waste rock deposit locations. The six samples from the TSF were composited into one sample for the TSF and geochemically analysed. The two waste rock samples were composited into one

representative waste rock sample and geochemically analysed. The samples were subjected to the following analyses:

- XRD whole rock analysis for mineral composition.
- Aqua regia leach with analysis of the following constituents: Ca, Mg, Na, K, Al, Si, V, Cr(total), Cr(VI), B, Ba, Mn, Fe, Co, Ni, Cu, Zn, As, Se, Sb, Mo, Cd, Pb, U, Th, Hg, F, CN (total).
- Distilled water leach with analysis of the following constituents: o pH, TDS, EC, total alkalinity, bicarbonate alkalinity, Ca, Mg, Na, K, Al, Si, V, Cr(total), Cr(VI), Ba, Mn, Fe, Co, Ni, Cu, Zn, As, Se, Sb, Mo, Cd, Te, Pb, U, Th, Hg, CN (total), B, SO4, NO3, NH4, NO2, PO4, Cl, F.
- ICP-MS: Quantitative analysis of above mentioned constituents for each of the leach tests

The macro-chemical leachate (LCT) analysis indicated that the leachate is close to neutral with a pH of 7.75 for the TSF and 7.17 for the waste rock material. Leachate of TDS (73 mg/L), SO4 (12 mg/L), and small quantities of NO3-N (3 mg/L) shows that the waste rock material does not generate any notable leachate (

Table 23). The low nitrate levels are due to the fact that the mine is in care and maintenance and does not generate nitrate. The residual nitrate decayed due to denitrification. The nitrate does not originate from the waste rock material and does not occur in mineral form in the XRD analyses as it is from ammonia nitrate based explosives used during mining.

There is no risk for acid mine drainage (AMD) as the sulphide content is insignificantly low with very low sulphide generating potential.

Furthermore, the proposed project is a stormwater upgrade project and the underground mining activities were already approved as part of the 2007 EMPR.

Table 23: Smokey Hills mine residue facilities - chemical and distilled water leach test results – macro-parameters

Analyses	TSF/COMPOSITE/GH/1172/Water/Leach/	Waste/Rock/GH/1171/Water/Leach/1:
Sample Number	491205	491206
TCLP / Acid Rain / Distilled Water / H_2O_2	Distilled Water	Distilled Water
Dry Mass Used (g)	50	50
Volume Used (mℓ)	1000	1000
pH Value at 25°C	7.75	7.17
Electrical Conductivity in mS/m at 25°C	6.08	9.46
Inorganic Anions	mg/ℓ	mg/ℓ
Total Dissolved Solids by sum	52	73
Total dissolved solids by EC	43	66
Phenolphthalein Alkalinity as CaCO3	<0.6	<0.6
Chloride as Cl	<0.25	0.96
Sulphate as SO4	2.79	12.3
Nitrate as N	1.34	2.96
Nitrite as N	<0.2	<0.2
Fluoride as F	<0.1	0.19
NH4	<0.01	<0.01
Phosphate	<0.8	<0.8
Hexavalent Chromium as Cr6+	<0.05	<0.05
Total Cyanide as CN	<0.01	<0.01

37.4.5. ENGINEERING OR MINE DESIGN SOLUTIONS TO BE IMPLEMENTED TO AVOID OR REMEDY ACID MINE DRAINAGE

Not applicable.

37.4.6. MEASURES THAT WILL BE PUT IN PLACE TO REMEDY ANY RESIDUAL OR CUMULATIVE IMPACT THAT MAY RESULT FROM ACID MINE DRAINAGE

Not applicable.

37.5. VOLUMES AND RATE OF WATER USE REQUIRED FOR THE MINING, TRENCHING OR BULK SAMPLING OPERATION

The mine's current water volume requirements will not be impacted by the proposed development.

37.6. HAS A WATER USE LICENCE BEEN APPLIED FOR?

An Integrated Water Use Licence Application Amendment will be submitted to the Department of Water and Sanitation (DWS) along with the Final EIA&EMPR. Please refer to the pre-application meeting minutes in Appendix 6.

37.7. IMPACTS TO BE MITIGATED IN THEIR RESPECTIVE PHASES

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

Table 24: Mitigation Measures to rehabilitate the environment

Nr	Activity	Size and scale of disturbance (Estimated volumes, tonnages and hectares or m2	Mitigation Measures	Compliance with Standards	Time period for implementation
Ecology					
Planning Phase					
1	Eradication of protected trees / flora through permit application	2 ha	Apply and obtain permits from DAFF after liaison with relevant officials and site visit to the area	NEMBA, NEMA	During the planning phase, prior to construction
Construction Phase					
2	Clearing of vegetation for infrastructure causing direct habitat destruction / fragmentation	2 ha	· The removal of the isolated indigenous trees and shrubs should only occur on the construction footprint area of the development and not over the larger area. Where possible, vegetation should be retained in between infrastructural elements associated with the project; · Conduct flora species search and rescue efforts before ground clearing begins in order to reduce negative impacts on species of concern; • Use existing facilities (e.g., access roads, parking lots, graded areas) to the extent possible to minimize the amount of new disturbance. • Ensure protection of important resources by establishing protective buffers to exclude unintentional disturbance. All possible efforts must be made to ensure as little disturbance as possible to the sensitive habitats such as ravines and moist grassland pockets during construction. • During construction, sensitive habitats must be avoided by construction vehicles and equipment, wherever possible, in order to reduce potential impacts. Only necessary damage must be caused and, for example, unnecessary driving around in the veld or bulldozing natural habitat must not	NEMBA, NEMA	During planning and construction phase

Nr	Activity	Size and scale of disturbance	Mitigation Measures	Compliance with	Time period for implementation
			take place. • Construction activities must remain within defined construction areas and the road servitudes. No construction / disturbance will occur outside these areas		
3	Topsoil & subsoil stripping, exposure of soils, ore and rock to wind and rain during construction causing erosion and sedimentation	2 ha	· Cover disturbed soils as completely as possible, using vegetation or other materials; · Minimize the amount of land disturbance and develop and implement stringent erosion and dust control practices.		
4	Vegetation clearing / vehicle movement	2 ha	· Control involves killing the alien invasive plants present, killing the seedlings which emerge, and establishing and managing an alternative plant cover to limit re-growth and re-invasion. The control of these species should even begin prior to the construction phase considering that small populations of the AIS occur around the sites; · Institute strict control over materials brought onto site, which should be inspected for seeds of noxious plants and steps taken to eradicate these before transport to the site. Routinely fumigate or spray all materials with appropriate low-residual herbicides prior to transport to site or in a quarantine area on site. The contractor is responsible for the control of weeds and invader plants within the construction site for the duration of the construction phase;		
5	Vegetation clearing / vehicle movement	2 ha	· Daily dampening of dust areas or other dust suppression methods such as dust-aside or more environmentally friendly methods. · Re-vegetation of impacted areas is to be conducted on an on-going basis.		
6	Heavy machinery and vehicle movement on site	2 ha	· Ensure that mining related waste or spillage and effluent do not affect the sensitive habitat boundaries and associated buffer zones. · This risk of spillages of reagents and hydrocarbons on the soil during transportation can be reduced with proper maintenance of vehicles. This would include a rigorous and proactive maintenance program		
7	Heavy machinery and vehicle movement on site; Construction of infrastructure, roads etc. on site	2 ha	· More fauna are normally killed the faster vehicles travel. A speed limit should be enforced (speed on site max 40 km/hour; Outside of the site 80 km/h. In Rain max 40 km/h). It can be considered to install speed bumps in sections where the speed limit tends to be disobeyed. (Speed limits will also lessen the probability of road accidents and their negative consequences). · Travelling at night should be avoided or limited as much as possible. No travelling at night should be allowed without approval by site manager;		

Nr	Activity	Size and scale of disturbance	Mitigation Measures	Compliance with	Time period for implementation
Soils					
Planning Phase					
1	Obtaining of IWUL for crossings (wetland soils) and mining layout on sensitive soils	2 ha	Apply and obtain IWUL from DWS after liaison with relevant officials and site visit to the area	NEMA, NEMWA, CARA	During the planning phase, prior to construction
Construction Phase					
2	Heavy machinery and vehicle movement on site	2 ha	• Soil should be handled when dry during removal and placement to reduce the risk of compaction; • Vegetation (grass and small shrubs) should not be cleared from the site prior to mining activities or construction (except if vegetation requires relocation as determined through an ecology assessment). This material is to be stripped together with topsoil as it will supplement the organic and possibly seed content of the topsoil stockpile depending on the time of soil stripping (whether plants are in seed or not); and • During construction, sensitive soils with high risk of compaction (e.g. clayey soils) must be avoided by construction vehicles and equipment, wherever possible, in order to reduce potential impacts. Only necessary damage must be caused and, for example, unnecessary driving around in the veld or bulldozing natural habitat must not take place. • Rip and/or scarify all compacted areas. Do not rip and/or scarify areas under wet conditions, as the soil will not loosen. Compacted soil can also be decompacted by "Rotary Decompactors" to effectively aerate soils for vegetation establishment.	NEMA, NEMWA, CARA	During planning and construction phase
3	Topsoil & subsoil stripping, exposure of soils, ore and rock to wind and rain during construction causing erosion and sedimentation in wetlands	2 ha	• When possible, topsoil stripping and excavation activities should be scheduled for the low rainfall season (winter); • Cover disturbed soils as completely as possible, using vegetation or other materials; • Minimize the amount of land disturbance and develop and implement stringent erosion and dust control practices. • Sediment trapping, erosion and storm water control should be addressed by a hydrological engineer in a detailed storm water management plan; • All aspects related to dust and air quality should be addressed by an air quality specialist in a specialist report;		

Nr	Activity	Size and scale of disturbance	Mitigation Measures	Compliance with	Time period for implementation
			• Protect sloping areas and drainage channel banks that are susceptible to erosion and ensure that there is no undue soil erosion resultant from activities within and adjacent to the construction camp and Work Areas; • Repair all erosion damage as soon as possible to allow for sufficient rehabilitation growth; • Gravel roads must be well drained in order to limit soil erosion;		
4	Heavy machinery and vehicle movement on site	2 ha	• Ensure that mining related waste or spillage and effluent do not affect the sensitive habitat boundaries and associated buffer zones. • This risk of spillages of reagents and hydrocarbons on the soil during transportation can be reduced with proper maintenance of vehicles. This would include a rigorous and proactive maintenance program • This risk can be further reduced through an adequate program of training of drivers and crews. This would include defensive driver training, basic vehicle maintenance, and emergency control of spills. In order for the vehicle crews to be adequately able to control any spills at an early stage, the vehicles must be properly equipped with spill containment equipment (booms, sandbags, spades, absorbent pads, etc.). Responsibility for training lies with the transport contractor. Adequate training, maintenance, and equipment of transport crews should be included as a requirement for transport contracts. • The hydrochloric acid tanks are contained within an epoxy-coated, concrete lined and bermed facility that has been designed to contain 110% of the volume of the tanks in the event of a spill. This eliminates the potential impacts to soils from spills of hydrochloric acid. • Spills from the tailings thickener will flow by gravity to the mine reclaim water ponds at the southern toe of the existing fines residue deposit. From there they will be pumped back to the processing plant. The area that would be affected by such a spill has already been impacted by the mining operation. • All employees will be trained in cleaning up of a spillage. The necessary spill kits containing the correct equipment to clean up spills will be made available at strategic points in the plant area.		
5	Topsoil & subsoil stripping	2 ha	• No specific mitigation can be applied during the construction phase of the mine to prevent soil destruction, although an important measures should be the correct handling and stockpiling of topsoil		
6	Topsoil & subsoil stripping,	2 ha	No specific mitigation can be applied during the construction phase itself to		

Nr	Activity	Size and scale of disturbance	Mitigation Measures	Compliance with	Time period for implementation
	Clearing of vegetation through wetlands and water courses for road crossings		prevent loss of land capability considering that the land use will change to industrial. This however, does not prevent the mine from ensuring that disturbance and clearing should be confined to the footprint areas of the mine and not over the larger area. This can be done in the following ways: • Corridors should be secured around the mining footprint areas to ensure the current land use (grazing) can continue in a functional way during mining. • Clearly demarcate the entire development footprint prior to initial site clearance and prevent construction personnel from leaving the demarcated area. This could be done through the fencing off the entire development footprint and institute strict access control to the portions of the owner-controlled property that are to remain undisturbed as soon as possible after initial site clearance. The fence should preferably be impermeable (for example a solid wall) to discourage invertebrates and small animals from entering the site. [Normally solid perimeter walls are not recommended in order to facilitate the movement of invertebrates, but in this case restriction of their movement into the area will be advantageous.] • All development activities should be restricted to specific recommended areas and strict buffer zones should be applied around the sensitive areas. The Environment Control Officer (ECO) should demarcate and control these areas. Unnecessary bulldozing through the veld should be avoided.		
Heritage					
Planning Phase					
1	Planning	19 ha	Site monitoring by ECO.	NHRA	Construction phase
2	Planning	19 ha	Avoidance, site function identification, site monitoring by ECO		Construction and planning phase

Nr	Activity	Size and scale of disturbance	Mitigation Measures	Compliance with	Time period for implementation
Hydrogeology					
Operational Phase					
1	Construction and operation of Pollution Control Dam (PCD)	2 ha	The PCDs are constructed for the operational phase and will remain on site after closure. This is actually a positive impact from the social and community as the dams will only contain fresh water and be available to the community for recreation and cattle watering or irrigation. Thus no mitigation required. During construction phase, adequate storm water management must be practiced, i.e. channelling of water so that increased suspended solids water during flood do not contaminate downstream clean water sources.	NWA, GN704	Planning, Construction and Operational Phases
2	Construction and operation of Pollution Control Dam (PCD)	2 ha	Mitigation measure 1: During the operational phase the affected mining surface area will be minimised to maximise natural runoff and minimise mine ("dirty") water runoff that will be captured and stored by the PCD. Channels will be created to allow as much clean water runoff to be diverted around the PCD and mining area in order for the clean water runoff to still reach the downstream destined drainages and surface water bodies. Post-operational: Once the mining site has been cleaned runoff from the PCDs (which are now clean water dams) and storage will be a positive impact.		
3	Construction and operation of Pollution Control Dam (PCD)	2 ha	Mitigation measure 1: This impact will probably occur if the PCD is not lined, but the PCDs will be lined. Recharge of the PCD water is not necessarily negative unless PCD water is of poor quality. In the case of the PCD water being of acceptable drinking water quality, this impact will be positive. The PCD water quality should be monitored bi-annually, or if required quarterly. In Post-operational phase the PCD will become normal clean water dams, thus they will provide water storage dams for the communities and for e.g. for livestock watering.		
4	Groundwater and surface water monitoring: Failure to adhere to monitoring and maintenance requirements	2 ha	Mitigation measure 1: Monitoring should be performed. Process water should be properly contained in process water pipes, channels and storage facilities and the infrastructure regularly inspected and maintained if required. Process water should be treated to an acceptable quality if the goal is for it to be released or it should be removed by professional hazardous waste contractors and stored and disposed of in a manner that is in line with environmental legislation.		
5	Groundwater and surface water	2 ha	Mitigation measure 1: Same as mitigation measure 1 for impact 3.1. A mine		

Nr	Activity	Size and scale of disturbance	Mitigation Measures	Compliance with	Time period for implementation
	monitoring: Failure to adhere to monitoring and maintenance requirements		water balance should also be in place and implemented.		
6	Storm water management	2 ha	Mitigation measure 1: A storm water management plan should be put in place and its recommendations and designs implemented where required and feasible.		

37.8. IMPACT MANAGEMENT OUTCOMES

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

Table 25: Impact Management Outcomes Table

Nr	Activity	Impact	Mitigation Type	Standard to be achieved	Roles and Responsibilities
Ecology					
Planning Phase					
1	Eradication of protected trees / flora through permit application	Delay of mining onset	Timely application for permits	NEMBA, NEMA	Project Proponent/EAP
Construction Phase					
2	Clearing of vegetation for infrastructure causing direct habitat destruction / fragmentation	Habitat destruction / fragmentation of fauna habitats	Control through access and footprint management	NEMBA, NEMA	SHEQ Manager / On-site ECO
3	Topsoil & subsoil stripping, exposure of soils, ore and rock to wind and rain during construction causing erosion and sedimentation	Soil erosion and sedimentation	Control through access and footprint management		

4	Vegetation clearing / vehicle movement	Spreading and establishment of alien invasive species	Control of materials brought onto site		
5	Vegetation clearing / vehicle movement	Habitat degradation due to dust	Control through dust suppression		
6	Heavy machinery and vehicle movement on site	Spillages of harmful substances	Prevention of spillages		
7	Heavy machinery and vehicle movement on site; Construction of infrastructure, roads etc. on site	Road mortalities of fauna / impact of human activities on site	Control of speed limits		
Soils					
Planning Phase					
1	Obtaining of IWUL for crossings (wetland soils) and mining layout on sensitive soils	Delay of mining onset	Control through timely application of license	NEMA, NEMWA, CARA	Project Proponent/EAP
Construction Phase					
2	Heavy machinery and vehicle movement on site	Soil compaction	Control through prevention and rehabilitation	NEMA, NEMWA, CARA	SHEQ Manager / On-site ECO
3	Topsoil & subsoil stripping, exposure of soils, ore and rock to wind and rain during construction causing erosion and sedimentation in wetlands	Soil erosion and sedimentation	Remedy through rehabilitation, revegetation and stabilisation		
4	Heavy machinery and vehicle movement on site	Spillages of harmful substances	Control through vehicle maintenance		
5	Topsoil & subsoil stripping	Soil destruction and sterilization	Control through correct handling and stockpiling of topsoil		
6	Topsoil & subsoil stripping, Clearing of vegetation	Loss of land capability	Control through access and		

	through wetlands and water courses for road crossings		footprint management		
Heritage					
Planning Phase					
1	Planning	Site EXIGO-SHP-FT01 (low significance)	Site monitoring by ECO.	NHRA	Project Proponent/EAP
2	Planning	Site EXIGO-SHP-FT02 (high significance)	Avoidance, site function identification, site monitoring by ECO		
Hydrogeology					
Operational Phase					
1	Construction and operation of Pollution Control Dam (PCD)	Alteration of natural topography and drainage patterns	Control through stormwater management	NWA, GN704	SHEQ Manager / On-site ECO
2	Construction and operation of Pollution Control Dam (PCD)	Alteration of runoff and surface water volumes reaching downstream surface water system/water bodies	Control through stormwater management		
3	Construction and operation of Pollution Control Dam (PCD)	Increased recharge due to permanent ponding of water on underlying soil and weathered rock	Management and monitoring of groundwater and surface water		
4	Groundwater and surface water monitoring:	Prolonged contamination of	Management and		

	Failure to adhere to monitoring and maintenance requirements	groundwater and surface water, erosion	monitoring of groundwater and surface water		
5	Groundwater and surface water monitoring: Failure to adhere to monitoring and maintenance requirements	No indication of how to manage process water infiltration into groundwater	Management and monitoring of groundwater and surface water		
6	Storm water management	Flooding of the processing plant and surrounding land uses	Control through stormwater management		

37.9. 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).

The necessary content required for this table has been included to Table 24 and Table 25 above.

Table 24 include the activity, Size and scale of disturbance, Mitigation Measures, Compliance with Standards, Time period for implementation and Table 25 the: Mitigation Type, Roles & Responsibility, and Standard to be achieved.

37.10. FINANCIAL PROVISION

37.10.1. DETERMINATION OF THE AMOUNT OF FINANCIAL PROVISION

37.10.1.1. Describe the closure objectives and the extent to which they have been aligned to the baseline environment described under Regulation 22 (2) (d) as described in 2.4 herein

The post closure land use proposed for the project area is to return the area to wilderness/natural area or area suitable for game and or grazing land. This excludes the portions of the pits which will only be partially backfilled.

The Soils, Agricultural Potential and Land Capability report (Henning, 2016) conducted for the project area state that the project area receives an annual rainfall between 400mm and 500mm which is considered low and unsuitable for crop cultivation under arable conditions.
Soils in the area are generally shallow with exposed bedrock outcrops and those that are somewhat suitable for agriculture are used for subsistence agriculture only. The Agricultural potential is thus classified as moderate to low. The limited soil on site can be used for rehabilitation post-mining if adequately managed. The closure objectives have been determined taking this into account.

The following closure objectives and goals are proposed:

1. To rehabilitate all disturbed land to a state that is suitable for its post closure use;
2. To ensure that affected areas are safe and secure for both human and animal activities;
3. The physical and chemical stability of the remaining structures should be such that risk to the environment through naturally occurring forces is eliminated;
4. To rehabilitate all disturbed land to a state where limited or preferably no post closure management is required;
5. To rehabilitate all disturbed land to a state that facilitates compliance with current environmental quality objectives (air and water quality); and
6. To limit the impact on personnel whose positions may become redundant on decommissioning of the mine.

37.10.1.2. Confirm specifically that the environmental objectives in relation to closure have been consulted with landowner and interested and affected parties

The environmental objective in relation to closure was reported in the Draft Scoping which was made available to all registered I&AP's for comment for a period of 30 days. All comments received and the relevant meeting minutes are appended to this report (Appendix 8.4: Public Meeting and Focus Group Meeting Minutes and Attendance Registers). The closure end land-use will stay unchanged from that approved in the mine's current EMPR (AGES, 2007).

37.10.1.3. 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.

Please refer to the Post Closure Site Layout in Appendix 7.6: Rehabilitation, Decommissioning and Mine Closure Plan.

The following will take place:

- Rehabilitation of access roads
- Demolition of housing and/or administrative facilities
- Opencast rehabilitation, including final voids and ramps
- Rehabilitation of overburden and spoils
- General surface rehabilitation
- Fencing
- Storm water management: the mine is also in the process of updating the SWMP and two pollution control dams are proposed. Five seepage capturing boreholes have been drilled.
- Ground and surface water management:
  - The downstream community utilises groundwater from boreholes, and because the aquifer system at the mine is classified as a 'Sole Source Aquifer', the groundwater must be afforded a non-degradation level of protection (Groundwater Quality Management Classification). The EMPR indicated that the existing TDF might probably be a contaminant of the groundwater resources.
  - Mitigating measures listed in the EMPR included:
    - An abstraction system down-gradient from the TDF to capture possible contaminated seepage during the operational phase of the mine - 5 boreholes have been completed for this purpose;
    - A suitable cover system for the TDF that will reduce groundwater contamination post-closure.
  - Seepage capturing boreholes have been drilled downstream of the TDF and a continuous monitoring programme of the water quality is in place. Samples are taken on a quarterly basis and tested at an independent water testing laboratory.
  - Ground water contamination rehabilitation is not included for in this provision. If this is found to be necessary, provision will be made for it in a subsequent annual update of the closure liability.

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

The rehabilitation plan has been compiled in accordance with the objectives and goals listed in section 6.2 of Appendix 7.6: Rehabilitation, Decommissioning and Mine Closure Plan and is deemed to be satisfactory according to the Mine and Petroleum Resources Development Act,

2002 (Act No. 28 of 2002) as amended and GNR 1147 of the National Environmental Management Act, 1988 (Act No. 107 of 1998).

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

Based on the calculations and financial estimates for the rehabilitation, closure and after care for the proposed Smokey Hills Mine Opencast Extension Project, is estimated as follows:

- The total estimated amount for rehabilitation and aftercare is R 296 456.

The **existing provision** for closure required for the proposed open pit extension and the existing mining activities **combined** will create a **shortfall of R 90 950** in the established fund of the Mine.

37.10.1.6. Confirm that the financial provision will be provided as determined.

Phokathaba Platinum (Pty) Ltd. has a dedicated rehabilitation and closure fund and a deposited sum with the DMR. These funds have an estimated combined current balance of R 9 617 852. In addition, a Guardrisk shortfall insurance policy of R 17.0M is in place.

The provision for closure required for the proposed project combined will create a **shortfall of R 90 950** in the established fund that will be provided.

37.11. MECHANISMS FOR MONITORING COMPLIANCE WITH AND PERFORMANCE ASSESSMENT AGAINST THE ENVIRONMENTAL MANAGEMENT PROGRAMME AND REPORTING THEREON, INCLUDING

a) Monitoring of Impact Management Actions
b) Monitoring and reporting frequency
c) Responsible persons
d) Time period for implementing impact management actions
e) Mechanism for monitoring compliance

37.11.1. ENVIRONMENTAL MONITORING AND AUDITING

DEAT (2004) defines environmental auditing as "a process whereby an organisation's environmental performance is tested against its environmental policies and objectives." Monitoring and auditing is an essential environmental management tool which is used to assess, evaluate and manage environmental and sustainability issues:

In order to ensure that the objectives of sustainable development and integrated environmental management are met and in order to obtain data which can inform continuous improvement of environmental practices at the site (adaptive management), monitoring and reporting will be an essential component of the proposed operations.

Monitoring and management actions associated with the project are contained in Table 26 of this report as well as in the various specialist reports associated with this project. This section provides a summary of the critical monitoring aspects per specific environmental field.

37.11.2. GENERAL MONITORING AND MANAGEMENT

The appointment of a suitably qualified on-site Environmental Control Officer (ECO) is essential to the successful implementation of this project, although this role can be fulfilled by the SHE Representative. The ECO will be responsible for the implementation of the EMP, applicable environmental legislation and any stipulations/conditions set by the relevant competent authorities (including but not limited to the DMR and DWS). The Environmental officer will conduct formal monthly site inspections and conduct an internal annual audit during the construction and operational phase.

An independent Environmental Control Officer (ECO) should also be appointed to conduct bi-annual (6 monthly) audits for the duration of the construction and operational phase. The Independent ECO should monitor the success and effective implementation of the environmental management measures stipulated by applicable legislation, the EIA&EMPR, and any conditions set by the competent authorities. Following each site visit, the ECO should submit a report to the DMR documenting the success/failure of the implementation of the management measures at the operations.

37.11.3. SPECIFIC MONITORING REQUIREMENTS

Monitoring of the proposed development (both on site and where appropriate in the surrounding environments) should be considered a high priority and should be conducted in accordance with the relevant specialist recommendations as summarized below:

37.11.4. MONITORING PROTOCOL

It is essential that during the construction and operational phase of the proposed development that the monitoring of certain elements are carried out to ensure compliance with regulatory bodies. A monitoring protocol for both the construction phase and the operational phase will be required. The monitoring only includes those activities identified in the EMPR and excludes any monitoring that should take place according to the water use license if and when it will be authorized.

37.11.5. MONITORING REQUIREMENTS AND RECORD KEEPING

To ensure that the procedures outlined throughout the EMPR are implemented effectively it will be necessary to monitor the implementation of the EMPR and evaluate the success of achieving the objectives listed in the EMPR. To ensure that all personnel on site are aware of their obligation to protect the environment, induction training will also include environmental awareness.

The audit procedure will include a Compliance audit, conducted by the Environmental Control Officer. Where the objectives of the EMPR are not being met the reasons will be determined and remedial action or variation to the tasks will be recommended. Major residual effects shall be documented in a Non-Conformance Report, during the construction and operational phases. Follow-up audits will be conducted as per the audit protocol in the EMPR.

37.11.5.1. Construction phase

The following monitoring needs to be conducted:

Refer to Table 26.

Monitoring must continue from the baseline monitoring already conducted, at least one year prior to construction so that seasonal variations are further accounted for over and above what is already known for the site.

37.11.5.2. Operational Phase

The following monitoring must be conducted:

Refer to Table 26.

37.11.6. AUDIT PROTOCOL

It is essential that during the construction and operational phases of the proposed development, the monitoring and auditing of certain elements are carried out to ensure compliance with regulatory bodies. An Audit Protocol for both the construction phase and the actual operational phase will be required. The auditing only includes those activities identified in the EIA&EMPR and excludes any auditing that should take place according to the water use license or any other legislative authorization process if and when they will be authorized.

37.11.6.1. Construction phase

The following audits need to be completed (valid for this EMPR):

- EMPR compliance (on a weekly basis): to be checked by an on-site ECO, SHE representative or Environmental manager (EM).
- EMPR compliance (on a bi-annual basis – 6 monthly): to be checked by an independent ECO.

37.11.6.2. Operational Phase

The following audits must be completed:

- External environmental compliance audits (EA and EMPR annually during operations).

37.11.7. ENVIRONMENTAL INCIDENTS

An environmental incident is defined as any unplanned event that results in actual or potential damage to the environment, whether of a serious or non-serious nature. An incident may involve non-conformance with environmental legal requirements, the requirements of the EMPR, or contravention of written or verbal orders given by the ECO or relevant authority.

In the event of any incident, an Environmental Incident Log should be completed and these reports should be kept on file by the Environmental Manager. Such reports should provide the following details:

- Date of the Incident (and time if relevant)
- Description of the nature of the incident (what happened)
- Explanation for current conditions (why it happened), responsible person, supporting photographs etc.
- Description of corrective actions taken

Corrective action to mitigate the impact (appropriate to the nature and scale of the incident) should be conducted immediately and affected parties notified.

In the case of serious incidents or emergencies, the incident report should be sent to the relevant authority as soon as possible after the incident has been recorded.

37.11.8. PENALTIES AND FINES FOR NON-COMPLIANCE OR MISCONDUCT

This EMPR forms part of the contract agreement between the Client and the Principal contractor. As such, non-compliance with conditions of the EMPR will amount to a breach of contract. Penalties will be issued directly to the contractor by the applicant in the event of non-compliance to the EMPR specifications. The issuing of a penalty will be preceded by a verbal warning by the applicant, as well as strict instruction in at least one monthly ECO report to rectify the situation. The ECO and applicant

will communicate with regards to realistic time-frames for possible rectification of the contravention, and possible consequences of continued non-compliance to the EMPR.

Penalties incurred do not preclude prosecution under any other law. Cost of rehabilitation and/or repair of environmental resources that were harmed by the actions of the contractor if such actions were in contravention of the specifications of the EMPR will be borne by the contractor himself. Penalties may be issued over and above such costs. The repair or rehabilitation of any environmental damage caused by non-compliance with the EMPR cannot be claimed in the Contract Bill, nor can any extension of time be claimed for such works. Penalty amounts shall be deducted from Certificate payments made to the Contractor.

The following categories of non-compliance are an indication of the severity of the contravention, and the fine or penalty amounts may be adjusted depending on the seriousness of the infringement.

- Category One – Acts of non-compliance that are unsightly, a nuisance or disruptive to adjacent landowners, existing communities, tourists or persons passing through the area.
- Category Two – Acts of non-compliance that cause minor environmental impact or localised disturbance.
- Category Three – Acts of non-compliance that affect significant environmental impact extending beyond point source.
- Category Four – Acts of non-compliance that result in major environmental impact affecting large areas, site character, protected species or conservation areas.

37.11.9. ENVIRONMENTAL AWARENESS PLAN

Environmental awareness training is critical for two primary reasons:

a) The workforce must understand how they can play a role in achieving the objectives specified in the EMPR; and
b) The workforce must understand their obligations in terms of the implementation of the EMPR and adherence to environmental-legislative requirements.

This environmental awareness plan is aimed at ensuring that employees, contractors, subcontractors and other relevant parties are aware of and able to meet their environmental commitments. This plan is to be updated on a yearly basis during the construction and operational phases of the project in light of operational changes, learning experiences and identified training needs.

All full time staff and contractors are required to attend an induction session when they start, which session should include environmental aspects.

It is therefore recommended that the ECO/Environmental Manager be involved in induction training. The induction sessions may be modified / adapted based on the audience attending the specific session, but it should ensure that all employees gain a suitable understanding of:

- Environmental requirements of the project, and how these will be implemented and monitored, including each employee's responsibilities with respect to environmental issues;

- Contents and commitments of the EMPR, including no-go areas, employee conduct, pollution prevention (prohibitions against littering, unauthorized fires, loud music, entry to adjacent properties, road conduct etc.);
- Environmentally sensitive areas on and around the proposed development sites, including why these are deemed important and how these are to be managed. Employees will also be made aware of protected species found on the site and how these are to be conserved, as well as alien invasive species potentially found on the site and how these should be managed; and
- Incident identification, remediation and reporting requirements: what constitutes an environmental incident (spillages, fire etc.) and how to react when such an incident occurs.

Environmental training will not be restricted to induction training sessions alone, but will be conducted on an on-going basis throughout the lifecycle of the project as and when required. Records are to be kept of the type of training given (matters discussed and by whom), date on which training was given and the attendees of each training session.

Table 26: Environmental Monitoring Table

Nr	Activity	Impact	Roles and Responsibilities	Functional Requirements for Monitoring	Monitoring and Reporting Frequency and Time Periods for Implementing Impact Management Actions
Ecology					
Planning Phase					
1	Eradication of protected trees / flora through permit application	Delay of mining onset	Project Proponent/EAP	Obtain protected tree permit from DAFF	Once-off, prior to construction
Construction Phase					
2	Clearing of vegetation for infrastructure causing direct habitat destruction / fragmentation	Habitat destruction / fragmentation of fauna habitats	SHEQ Manager / On-site ECO	For the purposes of the monitoring plan indicators should be chosen at the species level and landscape scale. The choice of indicators is based on recognized threats to biodiversity. The following indicators will be used for monitoring biodiversity in the study area: • Extent and condition of wetlands; • Habitat transformation; • Distribution and abundance of selected alien plant species; • Viability of populations of endangered endemic species; • Rehabilitation o Presence and percentage of pioneer species in the floral community o Presence/ absence and ratio of exotic versus indigenous species o Ratio of bare soil patches and ground cover o Presence, absence and trends in the	The indicators should be monitored biannually.
3	Topsoil & subsoil stripping, exposure of soils, ore and rock to wind and rain during construction causing erosion and sedimentation	Soil erosion and sedimentation			
4	Vegetation clearing / vehicle movement	Spreading and establishment of alien invasive species			
5	Vegetation clearing / vehicle movement	Habitat degradation due to dust			

6	Heavy machinery and vehicle movement on site	Spillages of harmful substances		occurrence of identified indicator/ sensitive species	
7	Heavy machinery and vehicle movement on site; Construction of infrastructure, roads etc. on site	Road mortalities of fauna / impact of human activities on site			
Soils					
Planning Phase					
1	Obtaining of IWUL for crossings (wetland soils) and mining layout on sensitive soils	Delay of mining onset	Project Proponent/EAP	n/a	n/a
Construction Phase					
2	Heavy machinery and vehicle movement on site	Soil compaction	SHEQ Manager / On-site ECO	Maintenance and monitoring of soil erosion and soil contamination on an ongoing basis.	Ongoing throughout construction
3	Topsoil & subsoil stripping, exposure of soils, ore and rock to wind and rain during construction causing erosion and sedimentation in wetlands	Soil erosion and sedimentation			
4	Heavy machinery and vehicle movement on site	Spillages of harmful substances			

5	Topsoil & subsoil stripping	Soil destruction and sterilization			
6	Topsoil & subsoil stripping, Clearing of vegetation through wetlands and water courses for road crossings	Loss of land capability			
Heritage					
Planning Phase					
1	Planning	Site EXIGO-SHP-FT01 (low significance)	Project Proponent/EAP	Considering the localised nature of heritage remains, the general monitoring of the development progress by an ECO or by the heritage specialist is recommended for all stages of the project. Should any subsurface palaeontological, archaeological or historical material, or burials be exposed during construction activities, all activities Should be suspended and the archaeological specialist Should be notified immediately	All stages of the project (construction and operation)
2	Planning	Site EXIGO-SHP-FT02 (high significance)			
Hydrogeology					
Operational Phase					
1	Construction and operation of Pollution	Alteration of natural topography and	SHEQ Manager / On-site ECO	1. Based on the groundwater quality monitoring results over the past two years there seems to	

	Control Dam (PCD)	drainage patterns		be a localised increase in nitrate (NO3) in the aquifer at SH02 and SH03. It is thought that the source of NO3 is spent explosives used in the blasting during mining. NO3 should be carefully monitored going forward to determine if there is a contamination plume migrating downstream of the open cast sections. 2. Currently there are not any monitoring boreholes close to the open cast pits and underground mining area on Hill 2 or Hill 3. It is recommended that at least one monitoring borehole, ±50-120 m deep be drilled at each hill depending on groundwater level depth encountered, close to the open cast areas. Alternatively one borehole in the saddle of Hill 2 and Hill 3. This borehole(s) can be drilled when the mine has been running for ± 6 months in order for the mine to be able to finance the drilling costs. 3. Based on numerical flow model and mass transport results from this investigation, seepage capturing boreholes will have to be equipped downstream in order to capture the contamination plume migrating from the tailings dam through the shallow weathered and alluvial aquifer. At least one suitable seepage capturing borehole has already been drilled during this investigation, numbered SHBH09. This borehole currently doubles as a groundwater monitoring borehole and has been equipped with protective borehole cap. 4. Based on mass (contaminant) transport results from this study's numerical model and existing intact seepage capturing boreholes, abstraction from seepage capturing boreholes will be required during the operational phase and ± 1 year post-closure to completely mitigate the TDS contamination risk at the school	
2	Construction and operation of Pollution Control Dam (PCD)	Alteration of runoff and surface water volumes reaching downstream surface water system/water bodies			
3	Construction and operation of Pollution Control Dam (PCD)	Increased recharge due to permanent ponding of water on underlying soil and weathered rock			
4	Groundwater and surface water monitoring: Failure to adhere to monitoring and maintenance requirements	Prolonged contamination of groundwater and surface water, erosion			
5	Groundwater and surface water monitoring: Failure to adhere to monitoring and maintenance requirements	No indication of how to manage process water infiltration into groundwater			
6	Storm water management	Flooding of the processing plant and surrounding land uses			

					borehole H12-2361. Four existing intact boreholes were used and simulated as seepage capturing boreholes abstracting in the model during LOM and capturing evaluated thereafter (Scenario 3). 5. It is recommended that when the mine is in operation again for approximately 6 months, that two water samples be taken from 1) the tailings dam penstock sump water after a 2-hour purging; and 2) from the process water (tailings liquor) on top of the tailings dam or in the process water circuit, during a water quality monitoring run. These samples only have to can be analysed for the normal range of monitoring constituents including TDS and NO3. 6. It is recommended that a sample be taken of the rain water in a clean mineral water bottle during the rainy season and provided to the monitoring team during their next sampling run at the mine. This task can be performed by the mining staff, as long as the water is not cross-contaminated by other water or solutions. Only chloride (Cl) has to be analysed for at the lab from this sample, which is a relatively inexpensive (R70) analysis. This will assist in better estimating the groundwater recharge for the site with the chloride method.	

37.12. INDICATE THE FREQUENCY OF THE SUBMISSION OF THE PERFORMANCE ASSESSMENT REPORT

Yearly performance assessment reports are recommended once the mine again becomes operational.

37.13. ENVIRONMENTAL AWARENESS PLAN

37.13.1. MANNER IN WHICH THE APPLICANT INTENDS TO INFORM HIS OR HER EMPLOYEES OF ANY ENVIRONMENTAL RISK WHICH MAY RESULT FROM THEIR WORK.

Refer to section 37.11.9.

37.13.2. MANNER IN WHICH RISKS WILL BE DEALT WITH IN ORDER TO AVOID POLLUTION OR THE DEGRADATION OF THE ENVIRONMENT.

Refer to Table 24 for the recommended mitigation measures to limit environmental impacts.

37.14. SPECIFIC INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

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

The Immediate Closure Provision will be updated yearly as part of the annual liability assessment required by the MPRDA and GNR 1147 in terms of the NEMA, once operations commence.

38. UNDERTAKING

The EAP herewith confirms

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

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

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

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

-END-

39. UNDERTAKING REGARDING CORRECTNESS OF INFORMATION

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

_ _____

Signature of the EAP

DATE:

40. UNDERTAKING REGARDING LEVEL OF AGREEMENT

I Herman Gildenhuys herewith undertake that the information provided in the foregoing report is correct, and that the level of agreement with interested and Affected Parties and stakeholders has been correctly recorded and reported herein.

_ _____

Signature of the EAP

DATE:

-END-

41. REFERENCES

AGES. 2007. Environmental Impact Assessment and Environmental Management Program for the Smokey Hills Project. Prepared for: Phokathaba Platinum (Pty) Ltd. Report Ref. No: AG-R-07-03-07

DWA. 1999. Gn704 Government Gazette, 4 June 1999 (Vol. 408, No. 20119) Regulations On Use Of Water For Mining And Related Activities Aimed At The Protection Of Water Resources. National Water Act, 1998 (Act No. 36 Of 1998).

DWA. 2004. Olifants River Water Management Area. Internal Strategic Perspective. Version 1. Directorate National Water Resources Planning.

GROBLER, N. & ENSLIN, H. 2016. Air Quality Scoping Report for the Smokey Hills Opencast Extension Project near Steelpoort, Mpumalanga. Airshed Planning Professionals. Report No: 16EXI02.

GROBLER, R.J. & VIVIER, J.J.P. 2016. Phokathaba Platinum: Smokey Hills Opencast Environmental Management Plan Report Amendment: Groundwater Scoping Assessment. Exigo Sustainability. Technical Report: ES16/134/1.

HENNING, B.J. 2016a. A Specialist Report on the Soils, Agricultural Potential And Land Capability For The Proposed Smokey Hills Mine Pollution Control Dams, Burgersfort Area, Limpopo Province.

HENNING, B.J. 2016b. An Ecological Impact Assessment and Riparian Delineation For The Proposed Smokey Hills Pollution Control Dams, Burgersfort Area, Limpopo Province.

HENNING, B.J. 2016c. A Wetland Delineation Report for the Smokey Hills Mine, Burgersfort Area, Limpopo Province.

ROBINSON, B.C.S. 2009. Platinum Australia Smokey Hills Platinum Mine Design Report for the Tailings Disposal Facility June 2009. Fraser Alexander Tailings. Report No: FA/BR/017/2009.

VIVIER, J.J.P. 2016. African Thunder Capital: Smokey Hills Platinum Mine – Dynamic Environmental Mine Water Balance Water specialist report (Draft). 1 November 2016. Exigo Sustainability. Project no ES16-134.

V&V, 2016. Smokey Hills Platinum Mine Stormwater Management Review November 2016. V&V Consulting Engineers. Report No. 1759_VV_SHPM SMP_2016002.

43. APPENDIX 1: EAP'S CURRICULUM VITAE & QUALIFICATIONS

44. APPENDIX 2: COMPANY PROFILE

45. APPENDIX 3: LOCALITY MAP

46. APPENDIX 4: SITE PLAN

47. APPENDIX 5: DMR PRE-APPLICATION MEETING DOCUMENTATION AND CORRESPONDENCE

48. APPENDIX 6: DWS PRE-APPLICATION MEETING DOCUMENTATION AND CORRESPONDENCE

49. APPENDIX 7: SPECIALIST REPORTS

49.1. APPENDIX 7.1: ARCHAEOLOGICAL IMPACT ASSESSMENT

49.2. APPENDIX 7.2: ECOLOGICAL AND WETLAND IMPACT ASSESSMENT

49.3. APPENDIX 7.3: SOILS, AGRICULTURAL POTENTIAL AND LAND CAPABILITY ASSESSMENT

49.5. APPENDIX 7.4: AQUATIC BIOMONITORING

49.6. APPENDIX 7.5: HYDROGEOLOGICAL IMPACT ASSESSMENT

49.7. APPENDIX 7.6: REHABILITATION, DECOMMISSIONING AND MINE CLOSURE PLAN

49.8. APPENDIX 7.7: HYDROGEOCHEMICAL SPECIALIST STUDY, WASTE CLASSIFICATION AND WATER QUALITY IMPACT ASSESSMENT

49.9. APPENDIX 8: PUBLIC PARTICIPATION DOCUMENTATION

49.9.1. Appendix. 8.1: Proof of advertisement

49.9.2. Appendix 8.2: Proof of site notice

49.9.3. Appendix 8.3: Proof of notification

49.9.4. Appendix 8.4: Public Meeting and Focus Group Meeting Minutes and Attendance Registers

49.9.5. Appendix 8.5 I&AP Correspondence

49.11. APPENDIX 9 DESIGN REPORTS

49.11.1. Appendix 9.1 Tailings dam design

49.11.3. Appendix 9.2 Stormwater Management Plan