

ANGLO AMERICAN PLATINUM LIMITED

# PROPOSED INSTALLATION OF SULPHUR DIOXIDE (SO<sub>2</sub>) ABATEMENT EQUIPMENT AT ANGLO AMERICAN PLATINUM LIMITED: POLOKWANE SMELTER

## ENVIRONMENTAL AND SOCIAL MANAGEMENT PROGRAMME

JUNE 22, 2017

PUBLIC





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ANGLO AMERICAN PLATINUM LIMITED

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*This Draft Environmental Impact Assessment Report (Report) has been prepared by WSP Environmental Proprietary Limited (WSP) on behalf and at the request of Anglo American Platinum Limited (Client), to provide the Client an understanding of the Relevant Documents.*

*Unless otherwise agreed by us in writing, we do not accept responsibility or legal liability to any person other than the Client for the contents of, or any omissions from, this Report.*

*To prepare this Report, we have reviewed only the documents and information provided to us by the Client or any third parties directed to provide information and documents to us by the Client. We have not reviewed any other documents in relation to this Report and except where otherwise indicated in the Report.*

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# 1 INTRODUCTION

## 1.1 BACKGROUND

Anglo American Platinum Limited (AAP) owns and operates three smelting complexes, namely Polokwane, Mortimer and Waterval. This project relates to the Polokwane Metallurgical Complex (PMC), which is located in the Limpopo Province of South Africa.

The PMC is an existing metallurgical industrial furnace where sulphide concentrates are smelted. Wet concentrate is received and dried in a flash dryer. The dry concentrate is smelted in an electric furnace, resulting in the recovery of platinum group metals (PGMs) and other base metals. The furnace matte is tapped, cast and crushed. The resulting furnace slag is stockpiled at a dedicated slag storage facility. The furnace off-gas is currently cooled in a forced draft cooler (FDC) before entering a bag-house to remove dust from the off-gas. The off-gas is then vented into the atmosphere via a 150m stack.

The National Environmental Management Air Quality Act (No. 39 of 2004) (NEM:AQA) requires that furnaces in metallurgical industries be operated with efficient SO<sub>2</sub> abatement systems by 1 April 2015, however PMC was given an extension until 1 April 2020. In order to comply with South African legislation (2020 limits), an SO<sub>2</sub> abatement system must be installed at the PMC.

The proposed strategy to achieve the Minimum Emission Standards (MES) is the installation of a WSA Plant that will convert the SO<sub>2</sub> contained in the off-gas into commercial-grade concentrated sulphuric acid (H<sub>2</sub>SO<sub>4</sub>). The exhaust from the WSA plant (containing reduced SO<sub>2</sub> concentrations) will be vented into the atmosphere, and the commercial grade sulphuric acid will be temporarily stored before being dispatched in the commercial market.

The area in which the development will be located is within the PMC, and is hereafter referred to as the development site.

WSP Environmental and Energy (WSP) has been appointed in the role of Independent Environmental Assessment Practitioner (EAP) to undertake the S&EIR processes for the development. The CV of the EAP is available in **Appendix A**. The EAP declaration of interest and undertaking is included in **Appendix B**. **Table 1-1** details the relevant contact details of the EAP. In order to adequately identify and assess potential environmental impacts, the EAP will be supported by a number of specialists.

**Table 1-1: Details of the Environmental Assessment Practitioner**

Environmental Assessment Practitioner (EAP)	WSP Environmental (Pty) Ltd
<b>Company Registration:</b>	1995/08790/07
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## 1.2 ENVIRONMENTAL MANAGEMENT PROGRAMME STRUCTURE

**Table 1-2** cross-references the sections within the EMPr with the legislated requirements as per Appendix 4 of GNR 982 of 2014.

**Table 1-2: Legislation Requirements as detailed in Appendix 4 of GNR 982**

Appendix 4	Legislated requirements as per the NEMA GNR 982	Relevant Report Section
<b>(a)</b>	details of-	
	(i) the EAP who prepared the EMPr; and	Section 1.1
	(ii) the expertise of that EAP to prepare an EMPr, including a curriculum vitae;	Section 1.1 and Appendix A
<b>(b)</b>	a detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;	Section 3
<b>(c)</b>	a map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that any areas that should be avoided, including buffers;	Section 3 Appendix C
<b>(d)</b>	A description of the impact management objectives, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including-	Section 3 Section 4 Section 7
	(i) planning and design;	
	(ii) pre-construction activities;	
	(iii) construction activities;	
	(iv) rehabilitation of the environment after construction and where applicable post closure; and	
(v) where relevant, operation activities;		
<b>(e)</b>	a description and identification of impact management outcomes required for the aspects contemplated in paragraph (d);	Section 7
<b>(f)</b>	a description of proposed impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraphs (d) and (e) will be achieved, and must, where applicable, include actions to -	Section 7
	(i) avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;	
	(ii) comply with any prescribed environmental management standards or practices;	
	(iii) comply with any applicable provisions of the Act regarding closure, where applicable; and	
(iv) comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable		
<b>(g)</b>	the method of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Section 6
<b>(h)</b>	the frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Section 6



Appendix 4	Legislated requirements as per the NEMA GNR 982	Relevant Report Section
<b>(i)</b>	an indication of the persons who will be responsible for the implementation of the impact management actions;	Section 6 Section 7
<b>(j)</b>	the time periods within which the impact management actions contemplated in paragraph (f) must be implemented;	Section 7
<b>(k)</b>	the mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);	Section 6
<b>(l)</b>	a program for reporting on compliance, taking into account the requirements as prescribed by the Regulations	Section 6
<b>(m)</b>	an environmental awareness plan describing the manner in which- (i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and (ii) risks must be dealt with in order to avoid pollution or the degradation of the environment; and	Section 6
<b>(n)</b>	any specific information that may be required by the competent authority	Not Applicable

### 1.3 APPLICABLE DOCUMENTATION

The following documents are to be read in conjunction with the EMPr:

- Environmental Impact Report (EIR) for the Proposed SO<sub>2</sub> Abatement System;
- Environmental authorisation issued by the LEDET in terms of the NEMA (still to be issued); and
- The AAP Environmental Management System.

## 2 GOVERNANCE FRAMEWORK

The South African regulatory framework establishes well-defined requirements and standards for environmental and social management of industrial and civil infrastructure developments. Environmental protection functions are carried out by different authorities at both national and regional levels.

**Table 2-1: Applicable Legislation and Policies**

Applicable Legislation and Policy	Reference Where Applied
<p><b>The Constitution of South Africa (No. 108 of 1996)</b></p>	<p>The Constitution cannot manage environmental resources as a stand-alone piece of legislation hence additional legislation has been promulgated in order to manage the various spheres of both the social and natural environment. Each promulgated Act and associated Regulations are designed to focus on various industries or components of the environment to ensure that the objectives of the Constitution are effectively implemented and upheld on an on-going basis throughout the country. In terms of Section 7, a positive obligation is placed on the State to give effect to the environmental rights.</p>
<p><b>National Environmental Management Act (No. 107 of 1998)</b></p>	<p>In terms of Section 24(2) of the NEMA, the Minister may identify activities which may not commence without prior authorisation. The Minister thus published GNR 983 (Listing Notice 1), 984 (Listing Notice 2) and 985 (Listing Notice 3) (4 December 2014) listing activities that may not commence prior to authorisation.</p> <p>The regulations outlining the procedures required for authorisation are published in GNR 982 [Environmental Impact Assessment Regulations (EIA)] (4 December 2014). Listing Notice 1 identifies activities that require a Basic Assessment (BA) process to be undertaken, in terms of the EIA Regulations, prior to commencement of that activity. Listing Notice 2 identifies activities that require an S&amp;EIR process to be undertaken, in terms of the EIA Regulations, prior to commencement of that activity. Listing Notice 3 identifies activities within specific areas that require a BA process to be undertaken, in terms of the EIA Regulations, prior to commencement of that activity.</p> <p>WSP undertook a review of the listed activities according to the proposed project description to conclude that Listed Activities 24, 27 and 34 of GNR 983, Listed Activity 4 of GNR 984 and Listed Activities 2, 4 and 10 of GNR 985 are considered applicable.</p>
<p><b>Listing Notice 1: GNR 983</b></p>	<p>(12) - The development of -</p> <p>(xii) infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs-</p> <p>(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse; -</p> <p><i>There is the potential that preferred access route alternative will be located within 32m of a watercourse.</i></p> <p>(24) - The development of -</p> <p>(i) a road for which an environmental authorisation was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in Government Notice 545 of 2010; or</p> <p>(ii) a road with a reserve wider than 13,5 metres, or where no reserve exists where the road is wider than 8 metres;</p> <p>But excluding -</p> <p>(a) Roads which are identified and included in activity 27 in Listing Notice 2 of 2014; or</p> <p>(b) Roads where the entire road falls within an urban area.</p> <p><i>A new road which will be wider than 8 metres but have a reserve of less than 30 metres will be constructed.</i></p> <p>(27) - The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for-</p> <p>(i) the undertaking of a linear activity; or</p>

Applicable Legislation and Policy	Reference Where Applied
	<p>(ii) maintenance purposes undertaken in accordance with a maintenance management plan.</p> <p><i>The majority of the development will be situated on previously impact areas, however there is the potential that 1 hectares or more, but less than 20 hectares of indigenous vegetation be cleared for the offices, contractors camp and proposed new roads.</i></p> <p>(34) - The expansion or changes to existing facilities for any process or activity where such expansion or changes will result in the need for a permit or licence or an amended permit or licence in terms of national or provincial legislation governing the release of emissions or pollution, excluding-</p> <p>(i) where the facility, process or activity is included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case the National Environmental Management: Waste Act, 2008 applies; or</p> <p>(ii) the expansion of or changes to existing facilities for the treatment of effluent, wastewater or sewage where the capacity will be increased by less than 15 000 cubic metres per day.</p> <p><i>The existing Atmospheric Emissions Licence (AEL) for Polokwane Smelter will have to be amended.</i></p> <p>(56) - The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre-</p> <p>(i) where the existing reserve is wider than 13,5 meters; or</p> <p>(ii) where no reserve exists, where the existing road is wider than 8 metres;</p> <p>excluding where widening or lengthening occur inside urban areas.</p> <p><i>An existing road will be widened by more than metres and lengthened by more than 1km.</i></p>
<p><b>Listing Notice 2: GNR 984</b></p>	<p>(4) - The development of facilities or infrastructure, for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of more than 500 cubic metres.</p> <p><i>The facility will store in excess of 500 cubic metres of dangerous goods.</i></p>
<p><b>Listing Notice 3: GNR 985</b></p>	<p>(2) - The development of reservoirs for bulk water supply with a capacity of more than 250 cubic metres.</p> <p>(a) In Free State, Limpopo, Mpumalanga and Northern Cape provinces:</p> <p>iii. Outside urban areas, in:</p> <p>(ff) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve</p> <p><i>A reservoir for the storage of water in excess of 250 cubic metres might be constructed.</i></p> <p>(4) - The development of a road wider than 4 metres with a reserve less than 13,5 metres.</p> <p>(a) In Free State, Limpopo, Mpumalanga and Northern Cape provinces:</p> <p>ii. Outside urban areas, in:</p> <p>(gg) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve, excluding disturbed areas; or</p> <p><i>A road wider than 4 metres will be developed in the Limpopo Province, outside an urban area. The site is situated within 5 kilometres of a protected area.</i></p> <p>(14) - The development of -</p> <p>(xii) infrastructure or structures with a physical footprint of 10 square metres or more; where such development occurs-</p> <p>(c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of the watercourse</p>

Applicable Legislation and Policy	Reference Where Applied
	<p>(a) In Free State, Limpopo, Mpumalanga and Northern Cape:</p> <p>ii. Outside urban areas, in:</p> <p>(hh) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve;</p> <p><i>There is the potential that preferred access route alternative will be located within 32m of a watercourse.</i></p>
<p><b>National Environmental Management: Air Quality Act (No. 59 of 2008)</b></p>	<p>In terms of section 21 of the NEM:AQA a list of scheduled processes were published in GNR893 (November 2013). Potential scheduled processes applicable are Category 1 and Subcategory 4.16.</p> <p>An atmospheric emissions license (AEL) is required for the smelting and converting of sulphidic ores. Due to the decrease in emissions (positive impact) from the Polokwane Smelter an amendment to the existing AEL as well as a revised emissions inventory will be required for the proposed project, once authorised.</p>
<p><b>National Water Act (No. 36 of 1998)</b></p>	<p>Section 22(1) of the NWA states that a person may only use water if the water use is authorised by a license under NWA or if the responsible authority has dispensed with a license requirement if it is satisfied that the purpose the NWA will be met by the granting of a license, permit or other authorisation under any other law.</p> <p>A person may only use water without a license if the water use is permissible:</p> <ul style="list-style-type: none"> <li>- Under Schedule I of NWA;</li> <li>- As a continuation of an existing lawful use; and</li> <li>- In terms of a general authorisation issued under Section 39 of NWA.</li> </ul> <p>Water uses are provided in Section 21 of the NWA.</p> <p><i>Polokwane Smelter was issued with Water Use Licence No: 27085555 on 23 August 2015. The licence will have to be amended as the construction of the preferred construction access road will be within 500 metres from a wetland as such a water use licence in terms of section 21 c and i may be required.</i></p>
<p><b>National Heritage Resources Act (No. 25 of 1999)</b></p>	<p>Section 34 and 38 of the National Heritage Resources Act (No 25 of 1999) (NHRA) details specific activities that require an approved heritage impact assessment by the South African Heritage Resources Association (SAHRA).</p> <p><i>A heritage permit will be required as a new road exceeding 300m in length will be constructed. In addition there is the potential 5 000m<sup>2</sup> may be cleared for the contractors camp and proposed new roads.</i></p>
<p><b>Civil Aviation Act (No. 13 of 2009)</b></p>	<p>Part 91.01.10 of the Civil Aviation Regulation (CAR) of 1997 states that "No person shall, through any act or omission, endanger the safety of an aircraft or person therein, or cause or permit an aircraft to endanger the safety of any person or property". In addition, Part 185.00.1(1)(f) makes non-compliance with the above-mentioned Regulation an offence. As navigable airspace is any airspace where "heavier than air" craft can operate, it means that any obstacle, anywhere, needs to be evaluated.</p> <p>The main reason is to control or prevent structures that could have a serious effect on aviation safety, especially in the vicinity of an aerodrome. (An aerodrome is a defined area on land or water intended for the arrival, departure and surface movement of aircraft – International Civil Aviation Organisation (ICAO) definition). It also follows that the knowledge of where obstacles are, will add to aviation safety.</p> <p>A database of all obstacles is kept and those above 60m above ground level are published in an Aeronautical Information Circular (AIC) and indicated on aeronautical maps. This data is also made available for other purposes such as for use on the on-board computers of some aircraft and for environmental research purposes.</p> <p>Any communications structure, building or other structure, whether temporary or permanent, which has the potential to endanger aviation in navigable airspace, or has the potential to interfere with the operation of navigation or surveillance systems or Instrument Landing Systems, including meteorological systems for aeronautical purposes, is considered an obstacle and shall be submitted to the Commissioner for Civil Aviation for evaluation (refer SA-CAR Part 139.01.30)</p>

**Applicable Legislation and Policy****Reference Where Applied**

	<p>Part 139.01.30 of the CAR outlines the regulations in terms of "Obstacle limitations and markings outside aerodrome or heliport". These include the following:</p> <ul style="list-style-type: none"><li>– All objects, whether temporary or permanent, which project above the horizontal surface within a specified radius of 8 kilometres as measured from the aerodrome reference point should be marked as specified in Document SA-CATS 139;</li><li>– Any other object which projects the horizontal surface beyond this radius or above the conical surface and which constitutes a potential hazard to aircraft must be marked as specified in Document SA-CATS 139;</li><li>– Buildings or other objects which will constitute an obstruction or potential hazard to aircraft moving in the navigable air space in the vicinity of an aerodrome, or navigation aid, or which will adversely affect the performance of the radio navigation or instrument landing systems, must not be erected or allowed to come into existence without the prior approval of the Director;</li><li>– No buildings or objects higher than 45m above the mean level of the landing area, or, in the case of a water aerodrome or heliport, the normal level of the water, must without the approval of the Director be erected within a distance of 8km measured from the nearest point on the boundary of an aerodrome or heliport;</li><li>– No building, structure or object which projects above a slope of 1 in 20 and which is within 3 000m measured from the nearest point on the boundary of an aerodrome or heliport must, without the prior approval of the Director be erected or be allowed to come into existence;</li><li>– No building, structure or other object which will project above the approach, transitional or horizontal surfaces of an aerodrome or heliport must, without the prior approval of the Director, be erected or allowed to come into existence;</li><li>– The obstacle limitation surface as prescribed in Document SA-CATS 139 must be clear of any penetration of obstacles temporary or otherwise; and</li><li>– In the event of a conflict of interest between land use authorities and air space users, air safety must be regarded as predominant and not to be compromised by land development projects or other obstacles.</li></ul> <p>PMC is approximately 17km from the Polokwane Smelter and the stack will be between 60 and 80m. This may be potentially result in an aviation obstacle and the aviation authority will be notified.</p>
<b>Capricorn District Municipality Guidelines</b>	<p><u>Emergency Services Bylaw:</u></p> <p>Subject to the provisions of the National Building Regulations and Building Standards Act, 1977 and the provisions of the Major Hazard Installation Regulations, every owner of premises on which there is a building in respect of which a floor layout change, addition, alteration, upgrading and/or renovation is envisaged, or the owner of premises on which bulk, aboveground and underground installations and any other structures are to be erected for the use, storage and handling of dangerous goods or erected in connection with such use, storage or handling, must submit plans in triplicate to the controlling authority on the prescribed form obtainable from the office of the Building Control Officer.</p> <p>No person may on any premises use, handle or store quantities of dangerous goods or permit them to be used, handled or stored, unless and until the person is in possession of a certificate of registration as provided for in Annexure II of these by-laws.</p>
<b>Polokwane Municipality</b>	<p><u>Noise Control Bylaw:</u></p> <p>No person may make, produce or cause a disturbing noise, or allow it to be made, produced or caused by any person, animal, machine, device or apparatus or any combination thereof.</p> <p>(1) No person may install, replace or modify a plant with a total input power exceeding 10 kilowatts on any premises, unless the municipality has been notified by the owner of the plant in writing at least 14 days before such installation, replacement or modification of-</p> <ul style="list-style-type: none"><li>(i) the particulars of the plant;</li><li>(ii) the number, street address and title deed description of the premises concerned; and</li><li>(iii) the date on which the installation, replacement or modification shall commence,</li></ul> <p>Provided that if an existing plant had to be replaced by necessity without preceding notification to the municipality, the municipality must be notified thereof by the owner of the plant in writing within 14 days after the replacement of the plant.</p>

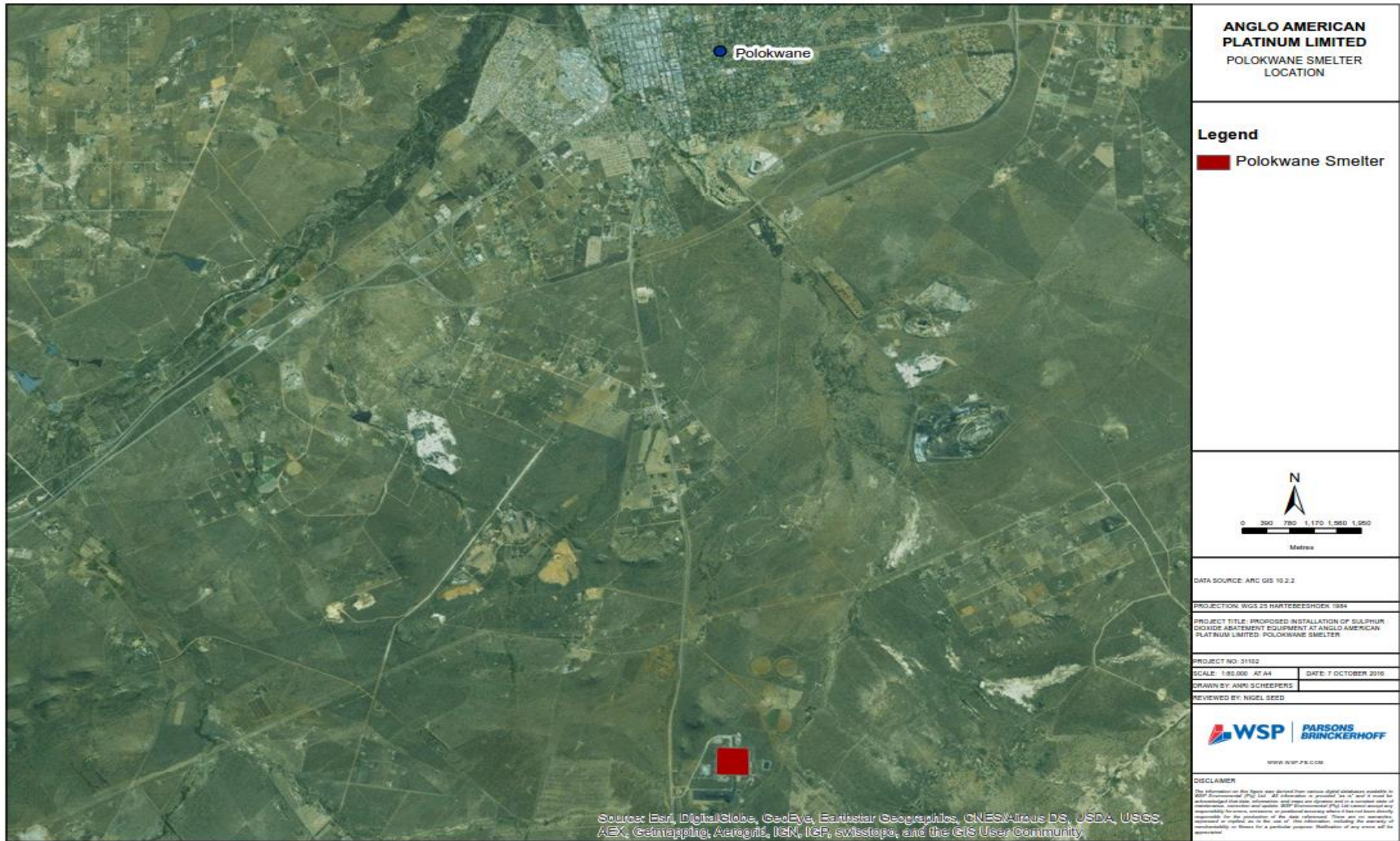


# 3 PROJECT DETAILS

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## 3.1 LOCATION OF PROPOSED DEVELOPMENT

The smelter is located off the R37 to Burgersfort, in the Eastern Limb of the Bushveld Igneous Complex on Portions 6 and 49 of the farm Palmietfontein 24KS (TOKS000000000240006 and TOKS000000000240049) located to the east of the Kopermyn road. The smelter is approximately 12 km south of the city of Polokwane (**Figure 3-1**).



**Figure 3-1: Location of Polokwane Smelter**



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## 3.2 PROPOSED PROJECT DEVELOPMENT ACTIVITIES

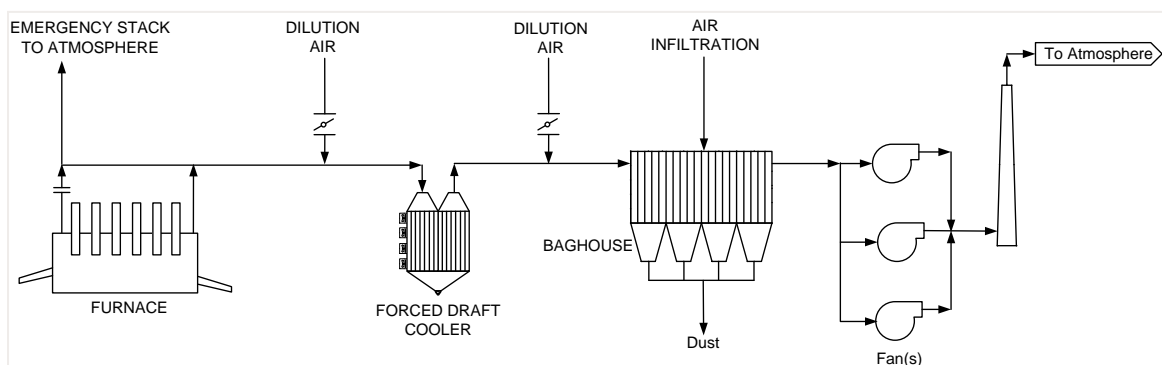
The concentration of SO<sub>2</sub> gas emitted from the Polokwane Smelter is approximately 1-2 vol%. Different SO<sub>2</sub> Abatement technologies were assessed during the Pre-Feasibility Study phase; during which the WSA technology supplied by Haldor Topsøe was identified as the most suitable SO<sub>2</sub> abatement technology to be implemented at Polokwane smelter. The following section comprises a description of the proposed gas cleaning and WSA process. The layout is provided in Appendix C.

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### 3.2.1 ELECTRIC FURNACE PRIMARY GAS CLEANING (EXISTING)

Polokwane Smelter contains a 68 megawatt furnace and produces a furnace gas with high dust content. The furnace off-gas is currently cooled in a forced draft cooler (FDC), with dilution air occasionally used to provide additional cooling. The cooled gas then enters a high pressure, low volume (HPLV), baghouse to dedust the off-gas.

The necessary draft for the off-gas system is provided by three VSD fans that are arranged in parallel. From the off-gas fans, the off-gas is currently routed to the process gas flue in the main smelter stack. The existing off-gas system is depicted in Figure 3-2.



**Figure 3-2: Flow Sheet of Existing Polokwane Off-Gas System**

Due to the nature of this system (dilution air, corrosion and negative pressure equipment), ingress air is introduced from the furnace to the baghouse outlet. Reducing or minimising ingress air to the acid plant is critical for the following reasons:

- Maintaining overall flowrates below the acid plant design criteria. If the acid plant cannot accommodate the flowrate required due to additional ingress air, consequences will include loss of freeboard pressure (hygiene / safety), exceeding stack emissions or the requirement to by-pass the acid plant completely. Alternatively the acid plant size could be increased to allow for the current flowrates (and ingress air), but this will result in a significant increase in capital cost and result in a significantly higher operating cost due the lower SO<sub>2</sub> concentration
- Maximising the SO<sub>2</sub> concentration into the acid plant to ensure operation at or as close to autothermal as possible. This will ensure the lowest possible energy requirement and therefore the operating cost

In order to address these concerns, the DFC will be replaced with a spray cooler and the bag-house with an electrostatic precipitator (ESP) to remove the bulk of the off-gas dust, ensuring efficient gas cleaning while maintaining off-gas temperatures well above sulphuric acid dewpoint.

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### 3.2.2 SECONDARY GAS CLEANING (NEW ADDITIONAL CLEANING)

While the furnace off-gas from the Electric Furnace Primary Gas Cleaning stage contains residual dust with a concentration ranging between 200-400 mg/Nm<sup>3</sup>; the WSA plant requires the gas to contain less than 1 mg/Nm<sup>3</sup> of dust. Therefore, additional equipment will be required to further clean and condition the off-gas prior to processing by the WSA Plant. The additional gas cleaning and conditioning equipment are proposed to be as follows:

- Scrubber – The hot off-gas will be saturated and cooled by water. A large portion of the remaining dust load will be captured in the scrubber water. The interaction of SO<sub>2</sub> with water will produce a weak acid effluent stream that will be transported to the effluent treatment plant for neutralisation.
- Gas cooling tower – Within the gas cooling tower, liquor is sprayed over a packed bed. The off-gas is passed through the bottom of this bed and emerges cooled to the desired WSA inlet temperature of 30 to 40° C.

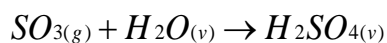
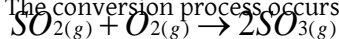
- Wet electrostatic precipitator (WESP) – Within a WESP, a flow of electrons is passed over the dust particles, which are consequently ionised with a negative charge. The collector surface within the WESP is oppositely charged, thus attracting and collecting all dust particles. In this way, the particulate matter concentration in the off-gas entering the WSA plant will be reduced to less than 1 mg/Nm<sup>3</sup> and the acid mist to below 20 mg/Nm<sup>3</sup>.

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### 3.2.3 WSA ACID PLANT

The furnace off-gas from the WESP will enter the WSA plant and be pre-heated by hot air from the condenser. The off-gas will be further heated by steam (or by burning LPG into the off-gas stream if required) to the required catalytic reaction temperature of ~400°C. The off-gas then enters the SO<sub>2</sub> converter, where the SO<sub>2</sub> in the off-gas is converted to SO<sub>3</sub> in the presence of a vanadium pentoxide catalyst. The heat generated by the exothermic conversion of SO<sub>2</sub> to SO<sub>3</sub> is captured by steam heat transfer system and fed back to heat the inlet air. The highly volatile SO<sub>3</sub> gas will react with water vapour in the off-gas to form H<sub>2</sub>SO<sub>4</sub> vapour

The conversion process occurs as follows:



The off-gas containing H<sub>2</sub>SO<sub>4</sub> vapour is fed into a condenser where it is cooled, causing the H<sub>2</sub>SO<sub>4</sub> vapour to condense on glass tubes to form liquid sulphuric acid with a concentration of between 95 wt% (weight percentage) to 98 wt%. The acid (at approximately 260°C) is collected at the bottom of the condenser and cooled before it is sent to the acid storage tanks. The stripped off-gas passes through a mist filter to remove any acid mist carried over from the condenser before finally being emitted to the atmosphere via the acid plant stack. The weak acid produced by the mist filter is fed to the effluent treatment plant for neutralisation.

The WSA condenser is well proven to produce sulphuric acid with a strength ≥95% H<sub>2</sub>SO<sub>4</sub> even for low strength feed gas (<1% SO<sub>2</sub>). However, in order to produce as close to 98% H<sub>2</sub>SO<sub>4</sub> strength as possible under all conditions, an integrated sulphuric acid concentrator (ISAC) can be added to the WSA condenser.

The ISAC is an add-on to the acid outlet of the condenser bottom. Acid is concentrated by blowing hot, dry air at a controlled rate through the ISAC (counter current with the acid) in order to vaporise excess moisture. The ambient air used is filtered, dehumidified, pressurised with a blower and heated before entering the ISAC.

The cleaned off-gas passes through a mist filter to remove any acid mist carried over from the condenser before finally being emitted to the atmosphere via the acid plant stack. The weak acid produced by the mist filter is fed to the effluent treatment plant for neutralisation.

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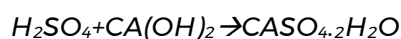
### 3.2.4 EFFLUENT TREATMENT PLANT

The effluent treatment plant (ETP) will treat all streams of effluent water produced by the SO<sub>2</sub> abatement equipment, including:

- Weak acid effluent (1 – 5% H<sub>2</sub>SO<sub>4</sub>) generated by the wet gas cleaning equipment;
- Acid mist from the mist filter in the WSA plant;
- Stormwater runoff / any acid spillages captured within the bunded plant area;
- Bleed off from the cooling towers; and,
- Blow-down from the steam system.

The effluent containing weak sulphuric acid (effluent stream (a) in the above list) will be neutralised by a hydrated lime slurry to produce gypsum before being mixed with the other effluent streams. The gypsum will be fed back to the furnace at Polokwane Smelter.

The neutralising process can be described by the following reaction:



The effluent treatment plant will have a daily throughput capacity of approximately 401m<sup>3</sup>.

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### 3.2.5 ACID PLANT COOLING WATER

Evaporative cooling towers will supply the cooling water required by the WSA and Gas Cleaning Plant. The hot water returning from the process will be collected within a hot water tank, where after it will be pumped to cooling towers, for cooling, before being recirculated. The water will be chemically treated with flocculants, and sand filters will be utilised to remove any particulate matter. A bleed stream will be fed into the ETP.

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### 3.2.6 DANGEROUS GOODS' STORAGE AND HANDLING

The acid produced by the WSA process will be stored in two storage tanks. It is envisaged that approximately 1 200m<sup>3</sup> of acid will be stored. The stored acid will be removed by accredited transporters.

LPG will be required by the WSA process for support heating (when the SO<sub>2</sub> concentration in the furnace off-gas is below the SO<sub>2</sub> concentration required for autothermal operation of the acid plant) and by the Mist Control Units. The peak LPG requirement will be during start-up of the WSA acid plant which can take up to 5 days. Potentially three additional LPG storage bullets of 22.5m<sup>3</sup> each will be installed.

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### 3.2.7 WATER USAGE

The development will require a maximum of 869 m<sup>3</sup>/day of water. It is envisaged that the water will be obtained from the existing allocation of 2 700m<sup>3</sup>/day potable to Polokwane Smelter. The Polokwane Smelter currently utilises 800m<sup>3</sup>/day potable and as such some of the allocated water is currently not being utilised.

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### 3.2.8 ROAD CONSTRUCTION AND USAGE

It is proposed that some of the existing internal roads will be surfaced and expanded, and that new roads will be constructed. The layout of the roads are attached in **Appendix C** and detailed below:

- Project access (10 m width and 873 m length)
  - Construction truck loop (18 m width and 135.3 m length)
  - Bus drop off loop (10 m width and 494.9 m length)
  - Construction store access (7 m width and 83.3 m length)
  - Permanent plant roads (6 m width and 390.7 m length)
- 

## 3.3 NEED AND JUSTIFICATION

The need for the project is predicated on the requirement for Polokwane Smelter to comply with the postponed MES requirements for SO<sub>2</sub> by 2020. The desirability of the project relates to the reduction in SO<sub>2</sub> emissions and associated positive impact on air quality (relative to current impacts); as well as the commercial-scale generation of sulphuric acid, and the associated revenue income.

The development is located at the existing Polokwane smelter, because the technology needs to be installed and connected to the existing gas cleaning equipment. The logistical and commercial disadvantages of locating the project on an alternative site would require new facilities to be established, which would be unreasonable and potentially technically and/or commercially unviable, as well as resulting in legal non-compliance at the Polokwane Smelter. As such no site alternatives were considered.

# 4 FINDING OF THE IMPACT ASSESSMENT

A summary of the identified impacts and corresponding (initial and residual) significance ratings for the proposed development is provided in **Table 4-1**.

**Table 4-1: Impact Summary**

No.	Impact Description	Phase	Without Mitigation					With Mitigation						
			Extent	Duration	Magnitude	Probability	Significance	Status	Extent	Duration	Magnitude	Probability	Significance	Status
T1	Alteration of Topography	Construction	1	4	4	4	Medium	Ve-	1	3	2	3	Low	Ve-
T2	Restoration of Topography	Closure	1	5	4	4	Medium	Ve+	No mitigation proposed					
C1	Carbon Footprint	Construction	1	2	2	4	Low	Ve-	No mitigation proposed					
C2	Carbon Footprint	Operational	4	5	1	5	Medium	Ve-	4	5	1	5	Medium	Ve-
C3	Local Climate Change	Operational	4	5	1	5	Medium	Ve-	4	5	1	5	Medium	Ve-
C4	Project Emissions for the National Inventory and Climate Change	Cumulative	4	5	1	5	Medium	Ve-	4	5	1	5	Medium	Ve-
SL1	Contamination of soils	Construction	2	2	2	4	Low	Ve-	1	2	2	4	Low	Ve-
SL2	Change in Land Capability	Construction	1	2	2	3	Low	Ve-	1	2	2	3	Low	Ve-
SL3	Contamination of soils	Operational	2	3	4	4	Medium	Ve-	1	1	2	3	Low	Ve-
SL4	Contamination of soils	Closure	2	5	4	3	Medium	Ve-	1	2	2	2	Low	Ve-
SL5	Quantity and Quality of Topsoil	Closure	3	3	4	4	Medium	Ve-	2	2	4	3	Low	Ve-
FL1	Loss of Diversity of Indigenous Floral Communities	Construction	1	5	4	4	Medium	Ve-	1	5	2	3	Low	Ve-
FL2	Loss of Diversity of Indigenous Floral Communities	Operational	1	3	4	3	Low	Ve-	1	1	2	3	Low	Ve-
FL3	Invasive Species	Closure	2	5	6	4	Medium	Ve-	1	1	2	4	Low	Ve-
FL4	Land Degradation	Closure	1	5	4	3	Low	Ve-	1	1	2	2	Low	Ve-
FA1	Loss of Habitat for Faunal Communities Including Species of	Construction	3	5	8	4	High	Ve-	1	5	6	3	Medium	Ve-

No.	Impact Description	Without Mitigation						With Mitigation						
		Phase	Extent	Duration	Magnitude	Probability	Significance	Status	Extent	Duration	Magnitude	Probability	Significance	Status
	Conservation Concern													
FA2	Loss of Fauna	Operational	1	3	4	3	Low	Ve-	1	1	2	3	Low	Ve-
AQ1	PM10 Concentrations on Receptors - Construction	Construction	2	2	4	4	Medium	Ve-	2	2	2	3	Low	Ve-
AQ2	PM2.5 Concentrations on Receptors - Construction	Construction	2	2	4	4	Medium	Ve-	2	2	2	3	Low	Ve-
AQ3	PM10 Concentrations on Receptors - Operational	Operational	2	5	2	3	Low	Ve-	2	5	2	2	Low	Ve-
AQ4	PM2.5 Concentrations on Receptors - Operational	Operational	2	5	2	2	Low	Ve-	1	5	2	1	Low	Ve-
AQ5	SO2 Concentrations on Receptors - Operational	Operational	2	5	6	3	Medium	Ve-	1	5	2	2	Low	Ve-
AQ6	PM10 Concentrations on Receptors - Closure	Closure	2	2	4	4	Medium	Ve-	2	2	2	3	Low	Ve-
AQ7	PM2.5 Concentrations on Receptors - Closure	Closure	2	2	4	4	Medium	Ve-	2	2	2	3	Low	Ve-
AQ8	PM10 Concentrations on Receptors - Cumulative	Cumulative	2	5	4	3	Medium	Ve-	2	5	4	3	Medium	Ve-
AQ9	SO2 Concentrations on Receptors - Cumulative	Cumulative	1	5	0	1	Low	Ve-	1	5	0	1	Low	Ve-
H1	Surface Water Contamination	Construction	2	2	6	4	Medium	Ve-	1	2	4	3	Low	Ve-
H2	Construction Activities Impacting on the CVB System	Construction	2	2	6	4	Medium	Ve-	1	2	4	3	Low	Ve-
H3	Surface Water Contamination	Operational	1	3	4	4	Medium	Ve-	1	2	2	3	Low	Ve-
H4	Operations Impacting on the CVB System	Operational	1	3	4	4	Medium	Ve-	1	2	2	3	Low	Ve-
H5	Surface Water Contamination	Closure	3	4	6	4	Medium	Ve-	1	1	4	2	Low	Ve-
H6	Closure Activities	Closure	2	4	4	4	Medium	Ve-	1	1	4	2	Low	Ve-

No.	Impact Description	Phase	Without Mitigation					With Mitigation					Status	
			Extent	Duration	Magnitude	Probability	Significance	Status	Extent	Duration	Magnitude	Probability		Significance
	Impacting on the CVB System													
GW1	Groundwater Contamination	Construction	2	3	6	4	Medium	Ve-	1	1	4	4	Low	Ve-
GW2	Groundwater Contamination	Operational	3	3	6	4	Medium	Ve-	1	2	4	4	Low	Ve-
GW3	Groundwater Contamination	Closure	3	4	6	4	Medium	Ve-	1	1	4	2	Low	Ve-
EN1	Noise as a Result of Construction Activities	Construction	1	2	4	3	Low	Ve-	1	2	2	3	Low	Ve-
EN2	Acoustic Impact on REC 02 and REC 03	Operational	2	4	4	3	Low	Ve-	2	4	4	3	Low	Ve-
EN3	Acoustic Impact on Residential Receptors	Operational	2	4	2	2	Low	Ve-	2	4	2	2	Low	Ve-
EN4	Noise as a Result of Closure Activities	Closure	1	2	4	3	Low	Ve-	1	2	2	3	Low	Ve-
EN5	Cumulative Noise	Cumulative	2	4	4	3	Low	Ve-	2	4	4	3	Low	Ve-
ACH1	Impact on Archaeological and Cultural Heritage	Construction	1	5	4	2	Low	Ve-	1	1	2	2	Low	Ve-
ACH2	Impact on Archaeological and Cultural Heritage	Closure	1	5	4	3	Low	Ve-	1	1	0	2	Low	Ve-
SES1	Employment Opportunities	Construction	3	2	4	3	Low	Ve+	3	2	4	4	Medium	Ve+
SES2	Local Economic Development Opportunities	Construction	3	2	4	3	Low	Ve+	3	2	4	4	Medium	Ve+
SES3	Nuisances	Construction	2	2	4	3	Low	Ve-	2	2	2	2	Low	Ve-
SES4	Retention of Existing Employees	Operational	2	4	4	4	Medium	Ve+	2	4	6	4	Medium	Ve+
SES5	Improvement in Ambient Air Quality	Operational	2	4	2	3	Low	Ve+	2	4	2	3	Low	Ve+
SES6	Loss of Employment Opportunities	Closure	3	4	4	3	Medium	Ve-	3	4	4	3	Medium	Ve-
V1	Visual Impact	Construction	1	2	2	4	Low	Ve-	1	2	2	4	Low	Ve-
V2	Visual Impact	Operational	2	3	2	4	Low	Ve-	2	2	2	3	Low	Ve-
V3	Visual Impact	Closure	2	3	2	4	Low	Ve-	2	2	2	3	Low	Ve-

No.	Impact Description	Phase	Without Mitigation					With Mitigation						
			Extent	Duration	Magnitude	Probability	Significance	Status	Extent	Duration	Magnitude	Probability	Significance	Status
HM1	Hazardous Materials Management	Construction	2	2	6	4	Medium	Ve-	1	2	2	3	Low	Ve-
HM2	Loss of Primary Containment of SO3 Gas in the WSA Plant	Operational	2	1	4	2	Low	Ve-	1	1	2	2	Low	Ve-
HM3	Loss of Primary Containment of SO2 Gas in the WSA Plant	Operational	1	1	4	2	Low	Ve-	1	1	2	2	Low	Ve-
HM4	Loss of Secondary Containment of Sulphuric Acid	Operational	1	1	2	2	Low	Ve-	1	1	2	1	Low	Ve-
HM5	Loss of Secondary Containment of Hydrated Lime / Effluent	Operational	1	1	2	2	Low	Ve-	1	1	2	1	Low	Ve-
HM6	Cessation of Hazardous Activities	Closure	1	5	4	3	Low	Ve+	1	5	4	3	Low	Ve+
HM7	Implementation of Proposed Project	Cumulative	2	4	4	4	Medium	Ve+	3	4	6	4	Medium	Ve+

# 5 ENVIRONMENTAL MANAGEMENT OBJECTIVES

The EMPr has the following objectives:

- Encourage good management practices through planning and commitment to environmental issues;
- Prevent water wastage;
- Minimise disturbance of the natural environment;
- Prevent or minimise all forms of pollution;
- Promote the reduction, reuse, recycling and recovery of waste;
- Adopt the best practical means available to prevent or minimise adverse environmental impacts;
- Comply with all applicable laws, regulations, standards and guidelines for the protection of the environment;
- Develop waste management practices based on prevention, minimisation, recycling, treatment or disposal of waste;
- Describe all monitoring procedures required to identify impacts on the environment; and
- Train onsite personnel with regard to their environmental obligations.

*Please note: This EMPr is a working document and therefore subject to change depending on the requirements of the various project phases. When applicable, these changes are to be approved in accordance with legislative requirements.*

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## 5.1 ENVIRONMENTAL OBJECTIVES AND TARGETS

To facilitate compliance to the EMPr, AAP must comply with all relevant legislation and standards and make personnel aware of the requirements of the EMPr as well as the prescribed penalties should a non-conformance be identified during the different phases of the proposed project.

It is recommended that environmental objectives (as outlined in this document) be emphasised to AAP as minimum requirements. Objectives include:

- Encourage good management practices through planning and commitment to environmental issues; and
- Provide rational and practical environmental guidelines to:
  - Minimise disturbance of the natural environment;
  - Ensure water and water resource protection;
  - Prevent or minimise all forms of pollution;
  - Protect indigenous flora and fauna;
  - Prevent soil erosion;
  - Promote sustainable use of resources;
  - Promote the reduction, reuse, recycling and recovery of waste;
  - Adopt the best practical means available to prevent or minimise adverse environmental impacts;
  - Comply with all applicable laws, regulations, standards and guidelines for the protection of the environment;
  - Develop waste management practices based on prevention, minimisation, recycling, treatment or disposal of waste;
  - Describe all monitoring procedures required to identify impacts on the environment;
  - Define how the management of the environment is reported and performance evaluated; and
  - Train onsite personnel with regard to their environmental obligations.



# 6 MANAGEMENT PROCEDURES AND ADMINISTRATIVE REQUIREMENTS

## 6.1 ORGANISATIONAL STRUCTURE AND RESPONSIBILITIES

Formal responsibilities are necessary to ensure that key management measures/procedures are executed. Specific responsibilities of the Project Manager, Site Manager and Environmental Control Officer (ECO) are as defined in **Table 6-1**.

**Table 6-1: Roles and Responsibilities**

Responsible Person	Responsibilities
<b>Project Manager</b>	<ul style="list-style-type: none"> <li>– Ensure that AAP and the contractor are aware of all specifications, legal constraints and AAP standards and procedures pertaining to the proposed development specifically with regards to environmental and social aspects;</li> <li>– Ensure that all conditions of the EA and EMPr are communicated and adhered to by AAP and its contractor(s);</li> <li>– Monitor the implementation of the EA conditions and the EMPr commitments throughout the proposed development by means of, but not limited to, site inspections and meetings. This should be documented as part of the onsite implementation records; and</li> <li>– Be fully conversant with the EIA Report for the Proposed Project, the conditions of the EA and of the EMPr.</li> </ul>
<b>Site Manager</b>	<ul style="list-style-type: none"> <li>– Be fully conversant with the EIA Report, the conditions of the EA and of the EMPr;</li> <li>– Approve method statements;</li> <li>– Provide support to the ECO;</li> <li>– Be fully conversant with all relevant environmental legislation and AAP environmental policies and procedures - Ensure compliance thereof;</li> <li>– Have overall responsibility for the implementation of the conditions of the EA and the EMPr;</li> <li>– Ensure that audits are conducted to ensure/assess compliance with the conditions of the EA and the EMPr;</li> <li>– Liaise with the Project Manager or his delegate, the ECO and others on matters concerning the environment;</li> <li>– Prevent actions that will harm or may cause harm to the environment, and take steps to prevent pollution and unnecessary degradation onsite; and</li> <li>– Confine project activities to demarcated areas.</li> </ul>
<b>Environmental Control Officer</b>	<ul style="list-style-type: none"> <li>– A suitably qualified ECO who would, on a weekly basis, monitor the project compliance with the conditions of the EA and the EMPr; and</li> <li>– The costs of the ECO shall be borne by AAP (proof of appointment must be maintained onsite).</li> </ul> <p>Responsibilities of the ECO include:</p> <ul style="list-style-type: none"> <li>– Be fully conversant with the EIA Report, the conditions of EA and the EMPr;</li> <li>– Be fully conversant with all relevant environmental legislation and AAP environmental policies and procedures - Ensure compliance thereof;</li> <li>– Ensure that periodic environmental performance audits/inspections are undertaken on a weekly basis to ensure implementation onsite;</li> <li>– Approve method statements;</li> <li>– Maintain the following:</li> </ul>

Responsible Person	Responsibilities
	<ul style="list-style-type: none"> <li>— A site incident register;</li> <li>— A non-conformance register;</li> <li>— A public complaints register; and</li> <li>— A register of audits.</li> <li>— Remain employed until the completion of the construction activities;</li> <li>— Hand over responsibilities to the operational team, if necessary, or remain appointed for the duration of the operational phase; and</li> <li>— Report all findings identified onsite to the Project Manager.</li> </ul> <p>In addition, the ECO will:</p> <ul style="list-style-type: none"> <li>— Convey the contents of the conditions of the EA and the EMPr to the relevant site staff and discuss the contents in detail with the Project Manager and contractor(s);</li> <li>— Undertake regular and comprehensive inspection of the site and surrounding areas in order to monitor compliance with the conditions of the EA and the EMPr;</li> <li>— Take appropriate action if the specifications contained in the EA and the EMPr are not followed;</li> <li>— Monitor and verify that environmental impacts are kept to a minimum, as far as possible; and</li> <li>— Ensure that activities onsite comply with all relevant environmental legislation.</li> </ul>
<p><b>Contractors, Staff and Service Providers</b></p>	<ul style="list-style-type: none"> <li>— Complying with AAP environmental management specifications;</li> <li>— Be conversant with all conditions of the EA and the EMPr, and ensure compliance thereto; and</li> <li>— Adhering to any environmental instructions issued by the Site Manager/Project Manager on the advice of the ECO.</li> </ul>

## 6.2 AWARENESS AND COMPETENCE

The NEMA requires that an environmental awareness plan be submitted as a part of the EMPr submission. The Proposed Project will utilise the existing AAP Training, Awareness and Competency Plan.

The following methodology is being used to implement and ensure environmental awareness:

- Internal Communication;
- Standard Meetings;
- Environmental Topics;
- External Communication;
- Complaints; and
- Training.

### 6.2.1 INTERNAL COMMUNICATION

- Internal Communication of environmental issues to ensure environmental awareness will be done by the following means:
- Meetings;
- Memos;
- Notice boards;
- Briefs;

- Reports;
  - Monthly themes;
  - Daily operational bulletin;
  - Newsletter;
  - E-mail;
  - Telephone; and
  - Induction training.
- 

### **6.2.2 STANDARD MEETINGS**

The following standard meetings are held at specific times to ensure that environmental awareness; potential problems, complaints etc. are heard and addressed proactively:

- Safety, Health and Environmental (SHE) Meetings are held monthly by the Senior Management;
  - SHE Meetings are held daily, weekly and monthly by the different operations and environmental issues are one of the topics on the agenda;
  - Monthly EMS meetings are held where environmental issues relating to the EMS are discussed; and
  - All employees can also communicate to Senior Management through their reporting lines or by using complaint forms and incident forms to improve communication.
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### **6.2.3 ENVIRONMENTAL TOPICS**

The following environmental topics are covered during the standard meetings:

- Water Quality;
  - Air Quality;
  - Waste Management;
  - Fauna and Flora;
  - Emergency Procedures;
  - Incidents Reporting;
  - Systems; and
  - General Environmental Awareness (e.g. World Environment Day, National Arbour Day).
- 

### **6.2.4 EXTERNAL COMMUNICATION**

Any environmental issues regarding the Proposed Project will be communicated to/from Head Office (in terms of Divisional and Group Communication) by means of the following:

- Fax or E-mail;
- News briefs from Head office;
- Formal meetings and workshops;
- Quarterly environmental report; and
- Annual environmental report.

Communication to community, government, neighbouring mines, farmers, land owner, environmental Groups, Non-Government Organisations and other stakeholders will be communicated to ensure environmental awareness by means of the following:

- Fax or E-mail;
- Postal system;

- Telephone;
  - Formal meetings; and
  - Open days.
- 

### **6.2.5 TRAINING**

The following facets to training form part of the Environmental Awareness Plan:

- Environmental awareness training is given at induction when personnel return from leave; and
  - Environmental competency training is given to supervisory personnel at the retained processing operations and contractors working at AAP.
- 

## **6.3 MONITORING**

The internal ECO will monitor the day-to-day site activities on an ongoing basis and will produce weekly monitoring reports. The external ECO will undertake monthly audits to ensure compliance with the EMPr and conditions of the environmental authorisation during the construction activities, and will report to the Site Manager should any non-compliance be identified or corrective action deemed necessary.

The existing Environmental Management System (EMS) will ensure conformance with the EMPr and conditions of the EA through the contract/work instruction specifications.

The following focus environmental aspects will be monitored with reference to the Proposed Project:

- Air quality;
- Noise levels;
- Surface water quality;
- Flora; and
- Fauna.

The ECO will ensure compliance with the EMPr and conditions of the EA during project activities, and will manage the monitoring actions described herein. Furthermore, the ECO will report to the Site Manager should any non-compliance be identified or corrective action deemed necessary. Only in severe cases of non-compliance, or repeated offences, will the ECO be required to report to the Site Manager.

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## **6.4 NON-CONFORMANCE AND CORRECTIVE ACTION**

The auditing of the construction activities may identify non-conformances to the EMPr and conditions of the environmental authorisation. Non-conformances may also be identified through incidents, emergencies or complaints recorded. In order to correct non-conformances, the source must be determined and corrective actions must be identified and implemented.

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### **6.4.1 COMPLIANCE WITH THE EMPr AND CONDITIONS OF THE ENVIRONMENTAL AUTHORISATION**

- A copy of the EMPr and conditions of the environmental authorisation will be available onsite at all times for the duration of the construction and operational activities;
- All persons employed by a contractor or their sub-contractors will abide by the requirements of the EMPr and conditions of the environmental authorisation;
- Any members of the workforce found to be in breach of any of the specifications contained within the EMPr and conditions of the environmental authorisation may be ordered by the Site Manager to leave the site. A contractor will not direct a person to undertake any activity which would place them in contravention of the specifications contained within the EMPr and conditions of the environmental authorisation;
- Should a contractor be in breach of any of the specifications contained in the EMPr and conditions of the environmental authorisation, the Site Manager will, in writing, instruct the contractor responsible for the incident

of non-compliance regarding corrective and/or remedial action required, specify a timeframe for implementation of these actions, implement a penalty and/or indicate that work will be suspended should non-compliance continue;

- Should non-compliance continue, further written notification will be forwarded to the contractor responsible for the incident of non-compliance outlining the required corrective and/or remedial action, the timeframe for implementation, penalties and/or work will be suspended as specified previously; and
  - Departmental officials will be given access to the property referred to in the Environmental Authorisation and EMPr for the purpose of assessing and/or monitoring compliance of the site, at all reasonable times.
- 

#### **6.4.2 DUTY OF CARE**

Under Section 28 of the NEMA all personnel involved with the construction and operational activities onsite will be responsible for implementing measures to prevent pollution or degradation of the environment from occurring, continuing or recurring. Failure to comply with the above conditions is a breach of the duty of care. If such harm is unavoidable, steps must be taken to minimise and rectify such pollution or degradation of the environment.

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### **6.5 DOCUMENTATION AND REPORTING**

The following documentation must be kept onsite in order to record compliance with the EMPr and conditions of the EA:

- Record of complaints; and
- Record of emergencies and incidents.

The contractor will be required to report on the following:

- Environmental incidents involving contractor/employees and/or the public;
- Environmental complaints and correspondence received from the public; and
- Incidents that cause harm or may cause harm to the environment.

The above records will form an integral part of the ECO's reports and records thereof maintained for the duration of the project. These records will be kept with the EMPr and conditions of the EA, and will be made available for scrutiny if so requested by the engineer or his delegate and the ECO.

The contractor will ensure that the following information is recorded for all environmental complaints/incidents/emergencies:

- Nature of complaint/incident/emergency;
  - Causes of complaint/incident/emergency;
  - Party/parties responsible for causing complaint/incident/emergency;
  - Immediate actions undertaken to stop/reduce/contain the causes of the complaint/incident/ emergency;
  - Additional corrective or remedial action taken and/or to be taken to address and to prevent reoccurrence of the complaint/incident/emergency;
  - Timeframes and the parties responsible for the implementation of the corrective or remedial actions;
  - Procedures to be undertaken and/or penalties to be applied if corrective or remedial actions are not implemented; and
  - Copies of all correspondence received regarding complaints/incidents/emergency.
- 

### **6.6 PUBLIC COMPLAINTS**

Public complaints should be directed through the existing Community Engagement Department at RPM public complaints system. The standard operating procedure should be made known to the appointed contractor. All complaints should be directed at the responsible party to resolve.

# 7 ENVIRONMENTAL MANAGEMENT PROGRAMME

This EMPr is based on the existing PMC EMP and Specialist recommendations. The EMPr identifies various actions which are undertaken throughout the construction, operational and closure phases. Not every action will be required during the entire course of activities. Therefore, the actions identified in the EMPr have been given priority timeframes for proposed implementation.

**Table 7-1: Structure of EMPr**

Column	Description
<b>Activity/Aspect</b>	Highlights the various activities/aspects associated with the project i.e. the contractors' activities that will interact with the environment.
<b>Environmental Measures and Action Plans</b>	Indicates the actions required to prevent and /or minimise the potential impacts on the environment that are associated with the project.
<b>Responsibility</b>	Indicates the party responsible for implementing the environmental measures and action plans laid out in the EMPr. Please note that the Site Manager will have authority to stop works if/as necessary.
<b>Priority Timeframe</b>	Indicates when the actions for the specific aspect must be implemented and/or monitored.

The following assumptions have been made in the development of the environmental specification in this EMPr:

- An environmental file containing the information/documentation required by this EMPr is to remain onsite and to be made available at the request of the auditor or similar monitoring body; and
- For ease of reference, any person(s) employed to assist in the project i.e. contractors, sub-contractor and permanent and temporary staff, will be collectively referred to as 'onsite personnel'.

It should be noted that at this point of the project planning process, the necessity for and timing of the decommissioning phase is unknown. Before decommissioning AAP will need to follow the related legal permitting process in terms of the NEMA and other legislation applicable at the time. The future associated permitting process will further supplement any commitments made within this document.

Table 7-2 outlines the EMPr for the proposed project.

None of the management measures are required to be include in the environmental authorisation and there are no additional monitoring requirements.

**Table 7-2: EMPR Commitments**

Ref	Impact Activity	Impact without mitigation	Impact with mitigation	Mitigation and Management Measure	Objectives	Performance Indicators	Applicable Development Phase			Responsible Person
							Construction	Operation	Closure	
<b>T1</b>	Alteration of Topography due to the construction of the SO <sub>2</sub> Abatement Plant, proposed road expansion and contractors laydown.	Medium -	Low -	– Restrict all activities, materials, equipment and persons within the area/s specified.	– To disturbance minimise to the topography	– The lay of the land must be similar than prior to the commencement of construction	X			Project Manager Site Manager
				– Erect and maintain permanent and/or temporary barricading prior to starting construction.			X			Project Manager Site Manager
				– Maintain all demarcation barriers for the duration of construction activities.			X			Site Manager
				– All excavations must be backfilled to the natural surface level; if a bulk factor exists it must be accommodated on the total area of disturbance.			X			Site Manager Contractors
				– Stockpiles created during the construction phase must not remain in the operation phase of the project			X			Site Manager Contractors
				– Sustainable erosion control measures (for wind and water erosion) must be implemented and maintained where necessary in areas disturbed by the construction / demolition operations.			X			Site Manager Contractors
				– All structures comprising the site establishment are removed from the site and surrounding areas.			X			Site Manager Contractors
				– All rubble is removed from the site to an approved licensed landfill site.			X			Contractors
				– Fences, barriers and demarcations associated with the construction phase are removed from the site.			X			Site Manager Contractors
<b>T2</b>	Restoration of topography during the closure phase.	Medium+		No mitigation proposed				X		
<b>C1</b>	Carbon emissions during the construction phase resulting in a carbon footprint	Low-		No mitigation proposed	– To reduce the effect on climate change	– Compliance to MES	X			
<b>C2</b>	Carbon emissions during the operational phase resulting in a carbon footprint	Medium-	Medium-	No mitigation proposed		– Compliance to Ambient Air Quality Standards		X		
<b>C3</b>	Carbon emissions during the operational phase resulting in local climate change	Medium-	Medium-	– Operations of the SO <sub>2</sub> Abatement Plant must be incorporated within the ECO2MAN* programme				X		Project Manager ECO
<b>C4</b>	Project emissions adding to the national inventory and climate change	Medium-	Medium-	– A greenhouse gas management hand book must be developed for the smelting facility as a whole.				X		Project Manager ECO
<b>SL1</b>	Construction activities resulting in contamination of soils	Low-	Low-	– Remove usable topsoil from construction site and stockpile.	– To collect and store usable topsoil for reuse with site rehabilitation. – To prevent soil contamination and thereby compromising future site rehabilitation and/or future land use	– No visible soil loss or accumulation – No notable areas of soil contamination present.	X			Contractors
				– Pave areas where contamination of soils are possible, such as bunded areas around workshops, etc			X			Contractors
				– Environmental conditions must be included in any construction contracts, thereby making contractors accountable for preventing accidental spillages by the implementation of ISO 14001 practices			X			Project Manager
				– All incidents must be reported to the responsible site officer as soon as they occur.			X			Contractors Eco
				– In the event of an incident the PMC Emergency Preparedness and Response Plan must be followed			X			Site Manager Contractors





Ref	Impact Activity	Impact without mitigation	Impact with mitigation	Mitigation and Management Measure	Objectives	Performance Indicators	Applicable Development Phase			Responsible Person
							Construction	Operation	Closure	
				<p>stored at any given time. Storage areas must be well marked with appropriate signage.</p> <ul style="list-style-type: none"> <li>– If a spillage of a hazardous material occurs the resultant hazardous waste must be cleaned up using absorbent material provided in spill kits on site and disposed of in a designated hazardous waste bin, as per the PMC procedures.</li> <li>– Any incidents must be reported as soon as possible. Measures must be put in place to prevent similar incidences from occurring. If necessary, remediation of any contamination must be carried out, as per the PMC procedures.</li> <li>– Spilled material must be cleaned up and disposed of appropriately as soon as practically possible, as per the PMC procedures.</li> <li>– All hazardous waste must be disposed of at a registered hazardous waste disposal facility or stored in designated, lined and bunded areas (for no longer than 90 days), as per the PMC procedures.</li> <li>– Records of all waste being taken off site must be recorded and kept as evidence, as per the PMC procedures.</li> </ul>						
								X		Site Manager
								X		Site Manager
								X		Site Manager
								X		Site Manager
								X		Site Manager
<b>SL4</b>	Closure activities resulting in contamination of soils	Medium-	Low-	<ul style="list-style-type: none"> <li>– All incidents must be reported to the responsible site officer as soon as they occur, as per the PMC procedures.</li> <li>– In the event of an incident the PMC Emergency Preparedness and Response Plan must be followed</li> <li>– Adherence to PMC's Environmental policy, Environmental procedures and values must be included in any construction contracts, thereby making contractors accountable for preventing accidental spillages by the implementation of good housekeeping practices.</li> <li>– All earth moving vehicles and equipment must be regularly maintained to ensure their integrity and reliability. No repairs may be undertaken at PMC.</li> <li>– If a spillage of a hazardous material occurs the resultant hazardous waste must be cleaned up using absorbent material provided in spill kits on site and disposed of in a designated hazardous waste bin, as per the PMC procedures.</li> <li>– Any incidents must be reported as soon as possible. Measures must be put in place to prevent similar incidences from occurring. If necessary, remediation of any contamination must be carried out, as per the PMC procedures.</li> <li>– Spilled material must be cleaned up and disposed of appropriately as soon as practically possible, as per the PMC procedures.</li> <li>– All hazardous waste must be disposed of at a registered hazardous waste disposal facility or stored in designated, lined and bunded areas (for no longer than 90 days), as per the PMC procedures.</li> <li>– Records of all waste being taken off site must be recorded and kept as evidence.</li> <li>– Sustainable erosion control measures (for wind and water erosion) must be implemented and maintained where necessary in areas disturbed by the construction / demolition operations.</li> <li>– To reduce dust entrainment, water or an appropriate dust suppressant must be sprayed on topsoil stockpiles until such time as the topsoil stockpiles have been re-vegetated.</li> </ul>					X	Site Manager Contractors
									X	Site Manager Contractors
									X	Contractors
									X	Contractors
									X	Contractors
									X	Contractors
									X	Contractors ECO
									X	Site Manager
									x	Site Manager

Ref	Impact Activity	Impact without mitigation	Impact with mitigation	Mitigation and Management Measure	Objectives	Performance Indicators	Applicable Development Phase			Responsible Person
							Construction	Operation	Closure	
SL5	The quantity and quality of topsoil is not adequate for successful rehabilitation	Medium-	Low-	<ul style="list-style-type: none"> <li>Volumes of stockpiled materials must be accurately recorded. Records must be made available on request.</li> </ul>					X	Site Manager Contractors
FL1	Construction activities resulting in a loss of diversity of indigenous floral communities	Medium-	Low-	<ul style="list-style-type: none"> <li>Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion during flood events. This will also reduce the likelihood of encroachment by alien invasive plant species;</li> </ul>	<ul style="list-style-type: none"> <li>To ensure that impacts to the biodiversity (fauna and flora) of the surrounding environment are ameliorated</li> </ul>	<ul style="list-style-type: none"> <li>Eradication of alien vegetation</li> <li>Establishment of natural vegetation</li> </ul>	X			Contractors
				<ul style="list-style-type: none"> <li>Compilation of and implementation of an alien vegetation management plan for the entire site.</li> </ul>			X			Project Manager
				<ul style="list-style-type: none"> <li>No grazing of domesticated stock will be allowed in the wetland area.</li> </ul>			X			Site Manager
				<ul style="list-style-type: none"> <li>The perimeter fence will be of such a construction as to allow passage of small mammals and rodents that reside in the wetland and forage in the surrounding savanna areas, and vice versa.</li> </ul>			X			Site Manager
				<ul style="list-style-type: none"> <li>The integrity of the fence isolating the wetland area will be maintained.</li> </ul>			X			Site Manager
				<ul style="list-style-type: none"> <li>No erosion gullies will be allowed to form within the area under management.</li> </ul>			X			Site Manager
				<ul style="list-style-type: none"> <li>Erosion gullies that either exist on the site, or which develop, will be closed, or appropriate berms and cross walls constructed to retain eroding soil.</li> </ul>			X			Site Manager
				<ul style="list-style-type: none"> <li>The collection of firewood and the collection of plants for medicinal purposes will only take place under supervision.</li> </ul>			X			Site Manager
				<ul style="list-style-type: none"> <li>Contractors are to be trained on environmental awareness and the importance of preserving indigenous fauna and flora.</li> </ul>			X			Project Manager Contractors
				<ul style="list-style-type: none"> <li>Ensure that all site disturbances are limited to areas where structures will be constructed / removed.</li> </ul>			X			Site Manager
				FL2			Operational activities resulting in a loss of diversity of indigenous floral communities	Low-	Low-	<ul style="list-style-type: none"> <li>Compilation of and implementation of an alien vegetation management plan for the entire site.</li> </ul>
<ul style="list-style-type: none"> <li>No grazing of domesticated stock will be allowed in the wetland area.</li> </ul>		X			Site Manager					
<ul style="list-style-type: none"> <li>The perimeter fence will be of such a construction as to allow passage of small mammals and rodents that reside in the wetland and forage in the surrounding savanna areas, and vice versa.</li> </ul>		X			Site Manager					
<ul style="list-style-type: none"> <li>The integrity of the fence isolating the wetland area will be maintained.</li> </ul>		X			Site Manager					
<ul style="list-style-type: none"> <li>No erosion gullies will be allowed to form within the area under management.</li> </ul>		X			Site Manager					
<ul style="list-style-type: none"> <li>Erosion gullies that either exist on the site, or which develop, will be closed, or appropriate berms and cross walls constructed to retain eroding soil.</li> </ul>		X			Site Manager					
<ul style="list-style-type: none"> <li>The collection of firewood and the collection of plants for medicinal purposes will only take place under supervision.</li> </ul>		X			Site Manager					
FL3	The infestation of alien invasive species during the closure phase	Medium-	Low-	<ul style="list-style-type: none"> <li>Compilation of and implementation of an alien vegetation management plan for the entire site.</li> </ul>				X	Site Manager ECO	
FL4	Land degradation during the closure phase	Low-	Low-	<ul style="list-style-type: none"> <li>No erosion gullies will be allowed to form within the area under management.</li> </ul>				X	Site Manager	
FA1	Construction activities resulting in a loss of habitat or faunal communities including species of conservation concern	High-	Medium-	<ul style="list-style-type: none"> <li>If any faunal species of conservation importance are recorded during construction, activities should temporarily cease and an appropriate specialist should be consulted to identify the correct course of action;</li> </ul>	<ul style="list-style-type: none"> <li>Conservation of wild fauna</li> <li>Improve fauna welfare</li> </ul>	<ul style="list-style-type: none"> <li>Proof of environmental awareness training</li> </ul>	X			Contractors ECO
				<ul style="list-style-type: none"> <li>Staff should be educated about the sensitivity of faunal species and measures should be put in place to deal with any species that are encountered during the</li> </ul>			X			Site Manager ECO

Ref	Impact Activity	Impact without mitigation	Impact with mitigation	Mitigation and Management Measure	Objectives	Performance Indicators	Applicable Development Phase			Responsible Person	
							Construction	Operation	Closure		
				<ul style="list-style-type: none"> <li>construction process. The intentional killing of any animals including snakes, lizards, birds or other animals should be strictly prohibited</li> <li>No trapping or snaring of wildlife will be permitted</li> <li>Ensure that all site disturbances are limited to areas where structures will be constructed / removed.</li> </ul>							
FA2	Operational activities resulting in a loss of fauna	Low-	Low-	<ul style="list-style-type: none"> <li>Staff should be educated about the sensitivity of faunal species and measures should be put in place to deal with any species that are encountered during the construction process. The intentional killing of any animals including snakes, lizards, birds or other animals should be strictly prohibited</li> <li>No trapping or snaring of wildlife will be permitted</li> <li>Ensure that all site disturbances are limited to areas where structures will be constructed / removed.</li> </ul>						Site Manager	
											Site Manager
AQ1	PM10 Concentrations on Receptors - Construction	Medium	Low	<ul style="list-style-type: none"> <li>Management procedures to ensure minimal disturbance can be employed during the construction and decommissioning phase to mitigate dust.</li> </ul>	<ul style="list-style-type: none"> <li>To limit dust and PM<sub>10</sub> causing off-site nuisance effects.</li> <li>To limit SO<sub>2</sub> Emissions</li> </ul>	<ul style="list-style-type: none"> <li>Compliance to MES</li> <li>Compliance to Ambient Air Quality Standards</li> </ul>	X			Site Manager Contractors	
AQ2	PM2.5 Concentrations on Receptors - Construction	Medium	Low	<ul style="list-style-type: none"> <li>Performing construction and remediation activities over separate portions will reduce wind erosion of open land.</li> </ul>			X			Site Manager Contractors	
AQ3	PM10 Concentrations on Receptors - Operational	Low	Low	<ul style="list-style-type: none"> <li>Wet suppression and wind speed reduction are common methods used to control open dust sources at construction sites, as a source of water and material for wind barriers tend to be readily available.</li> </ul>			X			Site Manager Contractors	
AQ4	PM2.5 Concentrations on Receptors - Operational	Low	Low	<ul style="list-style-type: none"> <li>General control methods for open dust sources, as recommended by the US EPA.</li> </ul>			X			Site Manager Contractors	
AQ5	SO2 Concentrations on Receptors - Operational	Medium	Low	<ul style="list-style-type: none"> <li>Limit vehicular traffic outside the demarcated smelter construction site area.</li> </ul>			X			Site Manager Contractors	
AQ6	PM10 Concentrations on Receptors - Closure	Medium	Low	<ul style="list-style-type: none"> <li>All earth moving vehicles and equipment must be regularly maintained to ensure their integrity and reliability.</li> </ul>			X			Contractors	
AQ7	PM2.5 Concentrations on Receptors - Closure	Medium	Low	<ul style="list-style-type: none"> <li>There must be strict speed limits on dust roads to prevent dust entrainment into the atmosphere.</li> </ul>			X			Site Manager Contractors	
AQ8	PM10 Concentrations on Receptors - Cumulative	Medium	Medium	<ul style="list-style-type: none"> <li>Management procedures to ensure minimal disturbance can be employed during the construction and decommissioning phase to mitigate dust.</li> </ul>			X			Site Manager Contractors	
AQ9	SO2 Concentrations on Receptors - Cumulative	Low	Low	<ul style="list-style-type: none"> <li>Contractors must be issued with appropriate PPE</li> <li>Limit vehicular traffic outside the demarcated smelter construction site area.</li> <li>It is recommended that existing and proposed mitigation techniques are maintained and that abatement machinery is regularly serviced according to supplier specifications</li> <li>It is recommended that PM<sub>10</sub> and dust fallout monitoring is continued to assess ambient concentrations and dust fallout levels.</li> <li>There must be strict speed limits on dust roads to prevent dust entrainment into the atmosphere.</li> <li>Employees must be issued with appropriate PPE</li> <li>All earth moving vehicles and equipment must be regularly maintained to ensure their integrity and reliability.</li> <li>There must be strict speed limits on dust roads to prevent dust entrainment into the atmosphere.</li> </ul>			X			Contractors	
					X		Site Manager				
					X		Project Manager				
					X		Project Manager ECO				
					X		Site Manager				
					X		Contractors				
						X	Contractors				
						X	Site Manager				

Ref	Impact Activity	Impact without mitigation	Impact with mitigation	Mitigation and Management Measure	Objectives	Performance Indicators	Applicable Development Phase			Responsible Person
							Construction	Operation	Closure	
				<ul style="list-style-type: none"> <li>Management procedures to ensure minimal disturbance can be employed during the construction and decommissioning phase to mitigate dust.</li> </ul>				X	Site Manager	
HI	Construction activities resulting in surface water contamination	Medium-	Low-	<ul style="list-style-type: none"> <li>The design for the proposed access road should be slightly realigned to ensure it is not located within the 1:100 floodline of the CVB system.</li> </ul>	<ul style="list-style-type: none"> <li>To limit the discharge of stormwater runoff laden with sediment and/or construction related water contaminants into the local surface water environment.</li> <li>To ensure that the site are located above the level of a flood with a recurrence interval of 100 years.</li> <li>To prevent contaminated process and/or stormwater generated on the plant site adversely affecting local surface water quality in the Sterkloop.</li> </ul>	<ul style="list-style-type: none"> <li>Check site levels against predicted flood bench mark level.</li> <li>Provision of the water quality control measures</li> </ul>	X			Project Manager
				<ul style="list-style-type: none"> <li>Implementation of the recommended buffer zone for the wetland.</li> </ul>			X			Site Manager Contractors
				<ul style="list-style-type: none"> <li>The construction footprint should be kept to a minimum with no construction activities to occur within the delineated boundary of the CVB system</li> </ul>			X			Site Manager Contractors
				<ul style="list-style-type: none"> <li>The access road should be positioned outside the 1:100 year floodline of the CVB system.</li> </ul>			X			Project Manager
				<ul style="list-style-type: none"> <li>Implementation of a no-go buffer zone for the wetland.</li> </ul>			X			Site Manager
				<ul style="list-style-type: none"> <li>The site should contoured to allow for surface water to readily drain away and to prevent ponding of water anywhere within the site.</li> </ul>			X			Site Manager Contractors
				<ul style="list-style-type: none"> <li>A stormwater management plan must be implemented for the temporary access road to prevent erosion/scouring and subsequent sedimentation of the CVB unit.</li> </ul>			X			Site Manager Contractors
				<ul style="list-style-type: none"> <li>The onsite operational storm water management plan must be updated by a qualified engineer. The runoff regimes post-construction activities matches that regimes pre-construction (i.e. without resulting in increased peak discharge to water resources, soil saturation in non-wetland areas and erosion/sedimentation).</li> </ul>			X			Project Manager
				<ul style="list-style-type: none"> <li>The development and implementation of a wetland rehabilitation and management plan. The plan should be completed prior to construction commencing.</li> </ul>			X			Site Manager ECO
				<ul style="list-style-type: none"> <li>The use of sediment curtains to prevent sediment entering the CVB system.</li> </ul>			X			Site Manager Contractors
				<ul style="list-style-type: none"> <li>The use of multiple temporary outlets must be considered over one/few larger stormwater outlets along the temporary access road. This will result in diffuse surface flow and minimise flow concentration and erosion. All stormwater detention and attenuation and outlet structures must be located outside of the CVB unit and buffer/exclusion zones with some allowance for outlet protection e.g. reno-mattresses, rock packs, filter strips).</li> </ul>			X			Project Manager Site Manager
				<ul style="list-style-type: none"> <li>All outlets must be designed to dissipate the energy of outgoing flows to levels that present a low erosion risk.</li> </ul>			X			Project Manager
				<ul style="list-style-type: none"> <li>All stormwater generated by the medium to high risk contamination 'dirty' areas must not be allowed to discharge into the surrounding environment.</li> </ul>			X			Site Manager
				<ul style="list-style-type: none"> <li>Dirty water generated from the SO<sub>2</sub> Abatement Plant must enter the 'dirty' water system of the Smelter.</li> </ul>			X			Project Manager Site Manager
				<ul style="list-style-type: none"> <li>Construction vehicles utilising the access road must be continuously maintained to ensure the number of hydrocarbon leaks is kept to a bare minimum.</li> </ul>			X			Contractors
				<ul style="list-style-type: none"> <li>Any contaminant spill (e.g. hydrocarbons) must be addressed immediately in line with a project specific Environmental Management Programme.</li> </ul>			X			Contractors
				<ul style="list-style-type: none"> <li>All earth moving vehicles and equipment must be regularly maintained to ensure their integrity and reliability. No repairs may be undertaken at PMC</li> </ul>			X			Contractors

Ref	Impact Activity	Impact without mitigation	Impact with mitigation	Mitigation and Management Measure	Objectives	Performance Indicators	Applicable Development Phase			Responsible Person
							Construction	Operation	Closure	
				<ul style="list-style-type: none"> <li>A site layout plan must be compiled indicating the limits of disturbance associated with the proposed development in relation to the identified sensitive areas (i.e. wetland and floodlines).</li> </ul>			X			Project Manager Site Manager
H2	Construction activities impacting on the CVB system	Medium-	Low-	<ul style="list-style-type: none"> <li>No-go areas and any stormwater infrastructure must be indicated on this plan along with environmental management measures, particularly erosion and sediment controls and measures.</li> </ul>			X			Project Manager Site Manager
				<ul style="list-style-type: none"> <li>Where feasibly possible, construction activities should be limited to the drier months of the year.</li> </ul>			X			Site Manager Contractors
				<ul style="list-style-type: none"> <li>Temporary erosion prevention berms should be installed along the length of the access road to decrease the concentration and velocity of runoff. This will aid in the prevention of gully formation and sedimentation. The following guidelines should be utilised for the placement of these berms:</li> <li>Where the longitudinal slope is: <ul style="list-style-type: none"> <li>less than 2%, berms should be installed every 50 m;</li> <li>between 2% and 10%, berms should be installed every 25 m;</li> <li>between 10%-15%, berms should be installed every 20 m;</li> <li>greater than 15%, berms should be installed every 10 m.</li> </ul> </li> <li>Berms shall be suitably compacted to a minimum height of 350mm.</li> <li>Berms should extend beyond the width of the road.</li> <li>Berms are to be constructed so that a canal is formed at the upslope side.</li> <li>Installed at approximately a 30-degree angle down slope. Ensure adequate drainage at the outflow, protected with stone, grass, sod, or anything that will reduce velocity of water.</li> <li>Inspected regularly and rebuilt periodically.</li> </ul>			X		Site Manager Contractors	
				<ul style="list-style-type: none"> <li>An embankment/berm must be placed along the road portion closest to the delineated edge of the wetland. The area would receive runoff from the road originating upslope at the propose SO<sub>2</sub> system site. This will allow for the discharge of stormwater further along the road, preventing direct concentrated water input into the wetland.</li> </ul>			X			Site Manager Contractors
				<ul style="list-style-type: none"> <li>The use of the graminoid species, Cynodon dactylon, at the outflows of these berms would be beneficial as this species prevents soil erosion and is recommended for the protection of waterways.</li> </ul>			X			Site Manager Contractors
				<ul style="list-style-type: none"> <li>An alien invasive management plan must be compiled and implemented to prevent further encroachment of these alien species into the disturbed areas caused by construction activities.</li> </ul>			X			Site Manager ECO
				<ul style="list-style-type: none"> <li>The existing water quality monitoring at the Smelter must continue in accordance with the water quality monitoring programme established for the site.</li> </ul>			X			Project Manager ECO
				<ul style="list-style-type: none"> <li>Dust suppression measures (e.g. water cart) must be implemented during construction along the access road to prevent sediment particles being deposited within the CVB unit.</li> </ul>			X			Contractors
				<ul style="list-style-type: none"> <li>A Work Method Statement must be compiled by the client and/or responsible contractor and should include aspects such as: <ul style="list-style-type: none"> <li>Proposed construction works;</li> <li>Materials and equipment to be utilised;</li> </ul> </li> </ul>			X			Project Manager Site Manager

Ref	Impact Activity	Impact without mitigation	Impact with mitigation	Mitigation and Management Measure	Objectives	Performance Indicators	Applicable Development Phase			Responsible Person
							Construction	Operation	Closure	
				<ul style="list-style-type: none"> <li>Procedures for transporting materials to/from site (entry/exit points and turning areas would be indicated on the site plan);</li> <li>Method and location of storage of material (this would be required to be indicated on a site plan);</li> <li>Procedures for containment of leaks/spills as well as associated emergency response plan/Spill Contingency Plan;</li> <li>Establishment and management of construction camps including location and extent (this would be indicated on a site plan);</li> <li>Management of stormwater;</li> <li>Recommendations outlined within this wetland assessment report;</li> <li>Sensitive area demarcation (this would be indicated on the site plan in agreeance with the wetland specialist);</li> <li>Management of construction materials (movement, storage, preparation/handling);</li> <li>Waste management;</li> <li>Erosion control/s;</li> <li>maintenance; and,</li> <li>Responsibilities of key personnel, e.g. project manager, contractor/site manager, ECO</li> </ul>						
				<ul style="list-style-type: none"> <li>Storage areas must have appropriate containment measures in place, including bunds, concrete, canals, collector drains and interception trenches.</li> </ul>			X			Site Manager Contractors
				<ul style="list-style-type: none"> <li>All hazardous substances must be stored on an impervious surface in a designated bunded area, able to contain 110 % of the total volume of materials stored at any given time. Storage areas must be well marked with appropriate signage, as per the PMC procedures.</li> </ul>			X			Site Manager Contractors
				<ul style="list-style-type: none"> <li>If a spillage of a hazardous material occurs the resultant hazardous waste must be cleaned up using absorbent material provided in spill kits on site and disposed of in a designated hazardous waste bin, as per the PMC procedures..</li> </ul>			X			Contractors
				<ul style="list-style-type: none"> <li>Any incidents must be reported as soon as possible. Measures must be put in place to prevent similar incidences from occurring. If necessary, remediation of any contamination must be carried out, as per the PMC procedures.</li> </ul>			X			Contractors ECO Contractors
				<ul style="list-style-type: none"> <li>Spilled material must be cleaned up and disposed of appropriately as soon as practically possible, as per the PMC procedures.</li> </ul>			X			Contractors
				<ul style="list-style-type: none"> <li>All hazardous waste must be disposed of at a registered hazardous waste disposal facility or stored in designated, lined and bunded areas (for no longer than 90 days).</li> </ul>			X			Contractors
				<ul style="list-style-type: none"> <li>Records of all waste being taken off site must be recorded and kept as evidence.</li> </ul>			X			Contractors ECO
<b>H3</b>	Operational activities resulting in surface water contamination	Medium-	Low-	<ul style="list-style-type: none"> <li>Implementation of a no-go buffer zone for the wetland.</li> </ul>				X		Site Manager
				<ul style="list-style-type: none"> <li>All stormwater generated by the medium to high risk contamination 'dirty' areas must not be allowed to discharge into the surrounding environment.</li> </ul>				X		Site Manager
				<ul style="list-style-type: none"> <li>Dirty water generated from the SO<sub>2</sub> Abatement Plant must enter the 'dirty' water system of the Smelter.</li> </ul>				X		Site Manager
				<ul style="list-style-type: none"> <li>Any contaminant spill (e.g. hydrocarbons) must be addressed immediately in line with a project specific Environmental Management Programme.</li> </ul>				X		Site Manager

Ref	Impact Activity	Impact without mitigation	Impact with mitigation	Mitigation and Management Measure	Objectives	Performance Indicators	Applicable Development Phase			Responsible Person
							Construction	Operation	Closure	
H4	Operational activities impacting on the CVB system	Medium-	Low-	– The existing water quality monitoring at the Smelter must continue in accordance with the water quality monitoring programme established for the site.				X		Site Manager
				– Storage areas must have appropriate containment measures in place, including bunds, concrete, canals, collector drains and interception trenches.				X		Site Manager
				– All hazardous substances must be stored on an impervious surface in a designated bunded area, able to contain 110 % of the total volume of materials stored at any given time. Storage areas must be well marked with appropriate signage.				X		Site Manager
				– If a spillage of a hazardous material occurs the resultant hazardous waste must be cleaned up using absorbent material provided in spill kits on site and disposed of in a designated hazardous waste bin, as per the PMC procedures..				X		Site Manager
				– Any incidents must be reported as soon as possible. Measures must be put in place to prevent similar incidences from occurring. If necessary, remediation of any contamination must be carried out, as per the PMC procedures..				X		Site Manager
				– Spilled material must be cleaned up and disposed of appropriately as soon as practically possible, as per the PMC procedures..				X		Site Manager
				– All hazardous waste must be disposed of at a registered hazardous waste disposal facility or stored in designated, lined and bunded areas (for no longer than 90 days), as per the PMC procedures..				X		Site Manager
				– Records of all waste being taken off site must be recorded and kept as evidence.				X		Site Manager
				H5			Closure activities resulting in surface water contamination	Medium-	Low-	– During the rehabilitation phase the C. dactylon filter strips must be removed and appropriately disposed of as a precautionary principle to prevent the continued movement of hydrocarbons through the natural system.
H6	Closure activities impacting on the CVB system	Medium-	Low-	– The access road must be rehabilitated to represent the natural vegetation type/unit of the area upon completion of construction activities. Continued monitoring of the rehabilitated site must occur in accordance with a rehabilitation and monitoring programme.				X	Site Manager Contractors	
GWI	Construction activities resulting in groundwater contamination	Medium-	Low-	– All earth moving vehicles and equipment must be regularly maintained to ensure their integrity and reliability. No repairs may be at PMC	– To prevent contaminated surface water and/or other potential groundwater contaminants to adversely affect groundwater quality and hence rendering it less fit for beneficial use.	– Stormwater channels functional and concrete liners in a good physical condition not displaying excessive wear – Paved bunded areas, draining to the dedicated sumps and installed sump pumps are functional.	X			Contractors
				– If a spillage of a hazardous material occurs the resultant hazardous waste must be cleaned up using absorbent material provided in spill kits on site and disposed of in a designated hazardous waste bin, as per the PMC procedures..			X			Contractors
				– Any incidents must be reported as soon as possible. Measures must be put in place to prevent similar incidences from occurring. If necessary, remediation of any contamination must be carried out, as per the PMC procedures..			X			Contractors
				– Spilled material must be cleaned up and disposed of appropriately as soon as practically possible, as per the PMC procedures..			X			Contractors
				– All hazardous waste must be disposed of at a registered hazardous waste disposal facility or stored in designated, lined and bunded areas (for no longer than 90 days), as per the PMC procedures.			X			Contractors
				– Records of all waste being taken off site must be recorded and kept as evidence.			X			Contractors ECO
				– Provide concrete lined stormwater collection channels up to the concrete lined(water tight) settling ponds upslope of the water pollution control dam.			X			Project Manager Site Manager

Ref	Impact Activity	Impact without mitigation	Impact with mitigation	Mitigation and Management Measure	Objectives	Performance Indicators	Applicable Development Phase			Responsible Person				
							Construction	Operation	Closure					
				– Bund workshop areas where spillage of oils and lubrication fluids are possible.			X			Site Manager Contractors				
				– Boreholes must be demarcated on a layout plan, with gps coordinates. The plan must be provided to contractors which must avoid disturbance of the boreholes.			X			Project Manager Site Manager				
<b>GW2</b>	Operational activities resulting in groundwater contamination	Medium-	Low-	– The SO <sub>2</sub> Abatement Plant must be underlain by concrete to minimise seepage.				X		Site Manager				
				– Polluted water (effluent and contaminated runoff) must be directed to a containment pond.				X		Site Manager				
				– Seepage must be collected in perimeter drains, which flow to the return water dams for reuse.				X		Site Manager				
				– Storage areas must have appropriate containment measures in place, including bunds, concrete, canals, collector drains and interception trenches.				X		Site Manager				
				– All hazardous substances must be stored on an impervious surface in a designated bunded area, able to contain 110 % of the total volume of materials stored at any given time. Storage areas must be well marked with appropriate signage.				X		Site Manager				
				– If a spillage of a hazardous material occurs the resultant hazardous waste must be cleaned up using absorbent material provided in spill kits on site and disposed of in a designated hazardous waste bin, as per the PMC procedures..				X		Site Manager				
				– Any incidents must be reported as soon as possible. Measures must be put in place to prevent similar incidences from occurring. If necessary, remediation of any contamination must be carried out, as per the PMC procedures..				X		Site Manager				
				– Spilled material must be cleaned up and disposed of appropriately as soon as practically possible, as per the PMC procedures..				X		Site Manager				
				– All hazardous waste must be disposed of at a registered hazardous waste disposal facility or stored in designated, lined and bunded areas (for no longer than 90 days), as per the PMC procedures.				X		Site Manager				
				– Records of all waste being taken off site must be recorded and kept as evidence.				X		Site Manager ECO				
				– Provide concrete lined stormwater collection channels up to the concrete lined(water tight) settling ponds upslope of the water pollution control dam.				X		Project Manager Site Manager				
				– Bund workshop areas where spillage of oils and lubrication fluids are possible.				X		Site Manager				
				<b>GW3</b>	Closure activities resulting in groundwater contamination	Medium-	Low-	– The infrastructure must be dismantled and removed on closure.				X		Site Manager Contractors
				<b>EN1</b>	Environmental noise as a result of construction activities	Low-	Low-	– Employees must be issued with appropriate PPE.	– Prevent environmental noise emissions	– No complaints on noise levels received	X			Contractors
<b>EN2</b>	Operations resulting in an acoustic impact at Rec 02 and Rec 03	Low-	Low-	– Employees must be issued with appropriate PPE.		– Noise level compliance with regulated standards		X		Contractors				
<b>EN3</b>	Operations resulting in an acoustic impact on residential receptors	Low-	Low-					X		Contractors				
<b>EN4</b>	Environmental noise as a result of closure activities	Low-	Low-	– Employees must be issued with appropriate PPE.					X	Contractors				
<b>EN5</b>	Environmental noise as a result of cumulative activities	Low-	Low-						X	Contractors				
<b>ACH1</b>	Construction activities impacting on archaeological and cultural heritage	Low-	Low-	– Should any archaeological artefacts be exposed during construction, activities in the vicinity of findings must be stopped immediately. Under no circumstances shall any artefact be destroyed. Such an archaeological site must be marked and fenced off, and the South African Heritage Agency must be	– Conservation of natural heritage resources	– Proof of environmental awareness training	X			Site Manager Contractors ECO				



Ref	Impact Activity	Impact without mitigation	Impact with mitigation	Mitigation and Management Measure	Objectives	Performance Indicators	Applicable Development Phase			Responsible Person
							Construction	Operation	Closure	
				contacted immediately. If these appear to be human remains the South African Police Service will also be contacted.		– Records of heritage findings				
<b>ACH2</b>	Closure activities impacting on archaeological and cultural heritage	Low-	Low-	– Prior to closure an assessment of all structures on site must be undertaken in order to determine their heritage importance.					X	Site Manager ECO
<b>SES1</b>	The creation of employment opportunities during construction activities	Low+	Medium+	– Recruitment should be undertaken in conjunction with the PMC Social Performance Coordinator.	– To enhance employment of local labour resources	– A defensible mix of local persons and those originating from elsewhere as labour force.	X			Project Manager
				– Should unskilled labour be required during the construction phase, this should be sourced from the local communities. This requirement must be specified within the contract signed by the contractor.			X			Project Manager
				– AAP is to ensure that any new or replacement employment and procurement opportunities maximise benefits to local communities.			X			Project Manager
				– Currently, AAP has a local recruitment and procurement policy in place, which their contractors must adhere to and provide evidence thereof.			X			Project Manager
				– Recruitment should be undertaken in conjunction with the PMC Social Performance Coordinator.			X			Project Manager
							X			Project Manager
<b>SES2</b>	Local economic development opportunities as a result of construction activities	Low+	Medium+	– This may be enhanced through consultation with local communities and leadership, as well as the Department of Labour.			X			Project Manager
<b>SES3</b>	The construction activities resulting in a nuisance for communities	Low-	Low-	– This engagement may include ascertaining the local skills levels and providing information on general and scarce skills needs, as well as procurement opportunities available at the AAP facility. This process would aim at encouraging local communities to develop skills for future employment at the Polokwane Smelter operations.			X			Project Manager
				– Compliance to the requirements of the Civil Aviation Regulation	X				Project Manager	
<b>SES4</b>	The retention of existing employees during the operational phase	Medium+	Medium+	– It is recommended that the existing stakeholder forums, as well as other community based engagement undertaken regularly by AAP, are maintained.				X		Project Manager
<b>SES5</b>	The improvement of air quality due to the operation of the SO <sub>2</sub> Abatement Plant	Low+	Low+	– AAP should review their engagement strategy to ensure that the various communities and stakeholder groups are well-represented and that regular and adequate communication is achieved with all relevant stakeholders. This will assist to mitigate potential social conflict arising from a breakdown in communication with some communities.				X		Project Manager
<b>SES6</b>	Loss of employment opportunities due to closure	Medium-	Medium-							
<b>VI</b>	Construction activities resulting in a visual impact	Low-	Low-	– Remove the absolute minimum vegetation and topsoil from the areas surrounding surface infrastructure. Ensure that all existing natural vegetation is retained wherever possible and incorporated into the site design.	– To limit intrusion due to smelter construction.	– Structures that blends to some degree into the existing landscape.	X			Contractors
				– Paint buildings and structures with colours that complement the natural colour of the surrounding landscape. Avoid pure whites and pure blacks.			X			Contractors
				– Provide articulated and/or texture to external surfaces to buildings and structures to create an interplay of light and shade, where possible			X			Contractors
				– Buildings should be as per the AAP standards.			X			Contractors
				– Stack to be a light colour.			X			Contractors
				– Place focused lighting at low levels and direct on specific objects, areas, or activities to reduce potential for light pollution.			X			Contractors

Ref	Impact Activity	Impact without mitigation	Impact with mitigation	Mitigation and Management Measure	Objectives	Performance Indicators	Applicable Development Phase			Responsible Person
							Construction	Operation	Closure	
V2	Operational activities resulting in a visual impact	Low-	Low-	<ul style="list-style-type: none"> <li>Waste heat in the WSA Process will be used to heat the final, clean off-gas to help prevent a white plume due to moisture</li> </ul>				X		Project Manager
V3	Closure activities resulting in a visual impact	Low-	Low-	<ul style="list-style-type: none"> <li>The plant infrastructure must be dismantled at closure and the plant area rehabilitated in line with the rehabilitation plan.</li> </ul>					X	Site Manager Contractors
HM1	Hazardous materials management during construction	Medium-	Low-	<ul style="list-style-type: none"> <li>Full compliance with all statutory requirements</li> </ul>	<ul style="list-style-type: none"> <li>To reduce potential hazardous situations arising from the management of dangerous goods</li> </ul>	<ul style="list-style-type: none"> <li>No hazardous situations report</li> <li>Incidence reports</li> </ul>	X			Project Manager
				<ul style="list-style-type: none"> <li>Compliance with applicable SANS codes, i.e. SANS 10087-3 (LPG), SANS 10400, SANS 10108, etc.</li> </ul>			X			Project Manager
				<ul style="list-style-type: none"> <li>Incorporation of applicable guidelines or equivalent international recognised codes of good design and practice into the designs</li> </ul>			X			Project Manager
				<ul style="list-style-type: none"> <li>Completion of a recognised process hazard analysis (such as a HAZOP study, FMEA, etc.) for the proposed facility prior to construction to ensure design and operational hazards have been identified and adequate mitigation put in place</li> </ul>			X			Project Manager
HM2	Loss of Primary Containment of SO <sub>3</sub> Gas in the WSA Plant	Low-	Low-	<ul style="list-style-type: none"> <li>Preparation and issue of a safety document detailing safety and design features of the design for reducing the impacts from toxic releases, loss of containment, fires, explosions and flammable atmospheres to form part of the required input to a quantitative risk assessment <ul style="list-style-type: none"> <li>including compliance to statutory laws, applicable codes and standards and world's best practice;</li> <li>including the listing of statutory and non-statutory inspections, giving frequency of inspections;</li> <li>including the auditing of the built facility against the safety document;</li> <li>noting that codes such as IEC 61511 can be used to achieve these requirements</li> </ul> </li> </ul>				X		Project Manager Site Manager
				<ul style="list-style-type: none"> <li>Demonstration by AAP or their contractor that the final designs would reduce the risks posed by the installation to internationally acceptable guidelines</li> </ul>				X		Site Manager Contractors
				<ul style="list-style-type: none"> <li>Sign-off for all SO<sub>2</sub> Abatement Project designs by a professional engineer registered in South Africa in accordance with the Professional Engineers Act, who takes responsibility for suitable designs;</li> </ul>				X		Project Manager
				<ul style="list-style-type: none"> <li>Completion of an emergency preparedness and response document for on-site and off-site scenarios prior</li> </ul>				X		Site Manager
HM3	Loss of Primary Containment of SO <sub>2</sub> Gas in the WSA Plant	Low-	Low-	<ul style="list-style-type: none"> <li>Permission not being granted for increases to the product list or product inventories without redoing part of or the full EIA</li> </ul>				X		Project Manager
				<ul style="list-style-type: none"> <li>Final acceptance of the facility risks for all the operations at Polokwane Smelter with a quantitative risk assessment that must be completed in according to a process based on a process similar to the one required for to the MHI regulations: <ul style="list-style-type: none"> <li>Basing such a risk assessment on the final design and including engineering mitigation.</li> </ul> </li> </ul>				X		Project Manager
				<ul style="list-style-type: none"> <li>Completion of an emergency preparedness and response document for on-site and off-site scenarios prior</li> </ul>				X		Site Manager
HM4	Loss of Secondary Containment of Sulphuric Acid	Low-	Low-	<ul style="list-style-type: none"> <li>The sulphuric acid storage, pumping and road tanker loading areas will be provided with bunds (secondary containment) to contain spillages and prevent losses to the ground and into surface water</li> </ul>				X		Site Manager Contractors
				<ul style="list-style-type: none"> <li>Level indication and controls are indicated to prevent overfilling of the acid storage tanks and when loading acid road tankers</li> </ul>				X		Site Manager
HM5	Loss of Secondary Containment of Hydrated Lime / Effluent	Low-	Low-	<ul style="list-style-type: none"> <li>Lime/hydrated lime will be used to neutralise acidic effluents generated from the process in the effluent plant. Bunded areas have been provided at the</li> </ul>				X		Site Manager

Ref	Impact Activity	Impact without mitigation	Impact with mitigation	Mitigation and Management Measure	Objectives	Performance Indicators	Applicable Development Phase			Responsible Person
							Construction	Operation	Closure	
				<ul style="list-style-type: none"> <li>effluent plant to prevent lime slurry and untreated effluent streams from entering the ground or surface water.</li> <li>– Spillage handling and effluent monitoring procedures are in place at the site, these would need to be updated to include the additional reagents.</li> <li>– The required dangerous good storage signage must be displayed as per legal and AAP standards.</li> </ul>						
								X		Site Manager
								X		Site Manager
<b>HM6</b>	Cessation of hazardous activities	Low+	Low+						X	
<b>HM6</b>	Implementation of the proposed project resulting in an overall reduction of sulphur emissions	Medium+	Medium+					X		

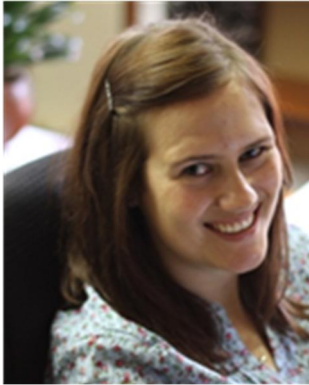
# APPENDIX

# A CURRICULA VITAE



# ANRI SCHEEPERS, BA

SENIOR ENVIRONMENTAL CONSULTANT (ENVIRONMENTAL SERVICES), ENVIRONMENT & ENERGY



## CAREER SUMMARY

Anri graduated from the University of Johannesburg with a BA honours in Geography in 2007, and has eight years work experience. Anri is a senior environmental consultant and is in the process of acquiring her MSc in Environmental Management from the North West University, Potchefstroom.

Anri's roles and responsibilities include the management of Basic Assessment Processes, Scoping and Environmental Impact Assessment Reporting Processes, Water Use Licence Application Processes and Waste Licencing Processes and the implementation of ISO 14000 and 9000 systems.

## EDUCATION

Bachelor of Science (Masters), Environmental Management, North West University, Potchefstroom, South Africa	Current
Bachelor of Arts (Honours), Geography, University of Johannesburg, Gauteng, South Africa	2007
Bachelor of Arts, Geography, University of Johannesburg, Gauteng, South Africa	2006

## ADDITIONAL TRAINING

Environmental Management Systems ISO 14001 Audit: Lead Auditor, Centre for Environmental Management, South Africa	2014
IWRM, Water Use Authorisations, and Water Use Licence Applications – Procedures, Guidelines, IWWMPs and Pitfalls, Carin Bosman Sustainable Solutions, South Africa	2012
ISO 14001 Environmental Management Systems (EMS), Implementation and Auditing, Centre for Environmental Management, South Africa	2011
IEMA Approved Foundation Course in Environmental Auditing, Aspects International, South Africa	2009

## PROFESSIONAL EXPERIENCE

### Environmental Authorisation Processes

- à Environmental Authorisation for Blue Sphere, Nigel, Gauteng, South Africa (2014): Consultant. This project includes an environmental impact assessment, environmental management programme report, water use license application, waste management license application and an atmospheric emissions licence application as well as the public participation process for the existing and proposed processes for Blue Sphere in Nigel. Client: Blue Sphere Investments and Trading 103 (Pty) Ltd.

### Environmental Management Programme Reports

- à EMPR Updates - Vaal River and West Wits Operations, Gauteng and North West, South Africa (2014): Project Manager. The alignment of the West Wits (WW) and Vaal River (VR) Operations Environmental Management Programme Reports (EMPR) in accordance with the requirements of the

## YEARS WITH THE FIRM

2

## YEARS TOTAL

9

## AREAS OF PRACTICE

Stakeholder Engagement  
Water Use License Applications  
Environmental Authorisation Processes  
Environmental Management Plans  
Waste Management  
Legal Compliance  
Environmental Management Systems  
Environmental Due Diligence and Liability Assessments

## LANGUAGES

Afrikaans

# ANRI SCHEEPERS, BA

Mineral and Petroleum Resources Development Act (No. 28 Of 2002) (MPRDA). Client: AngloGold Ashanti (Pty) Ltd.

- à Environmental Management Programme Report Consolidation and Alignment of Union Mine: Rustenburg Platinum Mines, North-West, South Africa (2014): Project Manager. The EMPR consolidation and alignment process combined the original EMPR and authorised EMPR amendments into a complete and comprehensive document, which will become the overarching EMPR for the mine lease area and will be used as a concise management tool for all employees operating within mine lease area. Client: Anglo American.

## Legal Compliance

- à Used Oil Industry Audits, Countrywide, South Africa (2014): Lead Auditor. Country-wide environmental compliance auditing of the South African recycled oil industry, comprising sixteen oil refinery operations, and twenty nine drum re-conditioning plants. The audits are primarily focussed on compliance to legislation and ensuring that each site follows international best practice. The audits include a review of the refineries ISO14000 auditor's findings, and tracking of compliance in regards to corrective actions. Client: ROSE Foundation.

## Environmental Due Diligence and Liability Assessments

- à Environmental and Social Due Diligence of 22 FMCG facilities, Country-wide, South Africa (2014): Lead Auditor. Transactional Environmental and Social Due Diligence for the acquisition of 22 FMCG facilities mainly in the food manufacturing and consumer formulated chemical sectors situated across South Africa for an international private equity and real estate investor. Client: Abraaj Group.

# APPENDIX

## **B** DECLARATION OF INTEREST AND UNDERTAKING



# LIMPOPO

PROVINCIAL GOVERNMENT  
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF  
**ECONOMIC DEVELOPMENT, ENVIRONMENT & TOURISM**

## DETAILS OF EAP AND DECLARATION OF INTEREST

	(For official use only)
File Reference Number:	
NEAS Reference Number:	
Date Received:	

Application for authorisation in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended and the Environmental Impact Assessment Regulations, 2014

### PROJECT TITLE

Proposed Installation of the Sulphur Dioxide (SO<sub>2</sub>) Abatement Equipment at Anglo American Platinum Limited: Polokwane Smelter.

Name of the Environmental Assessment Practitioner (EAP): <sup>1</sup>	Anri Scheepers		
Company Name:	WSP Environmental (Pty) Ltd		
Physical Address:	WSP House Bryanston Place 199 Bryanston Drive Bryanston		
	Code	2191	
Postal address:	PO Box 98867 Sloane Park		
Postal code:	PO Box 98867 Sloane Park 2152	Cell:	082 701 7690
Telephone:	011 300 6089	Fax:	011 361 1381
E-mail:	<a href="mailto:anri.scheepers@wspgroup.co.za">anri.scheepers@wspgroup.co.za</a>		
Professional affiliation(s) (if any)	None		



**The Environmental Assessment Practitioner**

I, Anri Scheepers, declare that –

General declaration:

- I act as the independent environmental practitioner in this application
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting environmental impact assessments, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, regulations and all other applicable legislation;
- I will take into account, to the extent possible, the matters listed in the EIA Regulations, 2014 when preparing an application and any report relating to the application;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- I will ensure that information containing all relevant facts in respect of the application is distributed or made available to interested and affected parties and the public and that participation by interested and affected parties is facilitated in such a manner that all interested and affected parties will be provided with a reasonable opportunity to participate and to provide comments on documents that are produced to support the application;
- I will ensure that the comments of all interested and affected parties are considered and recorded in reports that are submitted to the competent authority in respect of the application, provided that comments that are made by interested and affected parties in respect of a final report that will be submitted to the competent authority may be attached to the report without further amendment to the report;
- I will keep a register of all interested and affected parties that participated in a public participation process; and
- I will provide the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not
- all the particulars furnished by me in this form are true and correct;
- I will perform all other obligations as expected from an environmental assessment practitioner in terms of the Regulations; and
- I realise that a false declaration is an offence in terms of Regulation 48 and is punishable in terms of section 24F of the Act.

**Disclosure of Vested Interest (delete whichever is not applicable)**

- I do not have and will not have any vested interest (either business, financial, personal or other) in the proposed activity proceeding other than remuneration for work performed in terms of the Environmental Impact Assessment Regulations, 2014.



Signature of the Environmental Assessment Practitioner:

WSP Environmental (Pty) Ltd

Name of company:

2 March 2017

Date:

I certify that the DEPONENT has acknowledged that he/she knows and understands the contents of this affidavit, that he/she does not have any objection to taking the oath, and that he/she considers it to be binding on his/her conscience, and which was sworn to and signed before me

at BRYANSTON on this the 2<sup>nd</sup> day of MAR, 2017,  
**CRAIG ULYATE CA (SA)**  
Member No: 20012720  
WSP House, Bryanston Place, 199 Bryanston Drive, Bryanston,  
PO Box 98867, Sloane Park 2152, South Africa

Reference: 31102

**WSP Environmental (Pty) Ltd**

2 March 2017

South View, Bryanston Place Office Park  
199 Bryanston Drive, Bryanston  
Republic of South Africa, 2191  
PO Box 98867, Sloane Park, 2152  
Tel: +27 (0)11 361 1380  
E-mail: wspe@wspgroup.co.za  
Web: http://www.wspgroup.co.za

**AFFIRMATION BY ENVIRONMENTAL ASSESSMENT PRACTITIONER**  
**As required in terms of Appendix 2, subsection (j) and (k) of**  
**Government Notice Regulation (GNR) 982**

WSP Environmental (Pty) Ltd  
Registered Number: 1995/08790/07

<b>Project Name:</b>	Proposed Installation of the Sulphur Dioxide (SO <sub>2</sub> ) Abatement Equipment at Anglo American Platinum Limited: Polokwane Smelter.
<b>Consultant:</b>	WSP Environmental (Pty) Ltd
<b>EAP Details</b>	
<b>Contact Person:</b>	Anri Scheepers
<b>Postal Address:</b>	P O Box 98867, Sloane Park, 2152
<b>Physical Address:</b>	South View, Bryanston Place, 199 Bryanston Drive, Bryanston, 2191
<b>Telephone:</b>	011 300 6089
<b>Fax:</b>	011 361 1381
<b>Email:</b>	<a href="mailto:Anri.Scheepers@wspgroup.co.za">Anri.Scheepers@wspgroup.co.za</a>

**A member of the WSP Global Inc.**  
**Offices worldwide**

I, Anri Scheepers, the appointed Environmental Assessment Practitioner (EAP), confirm through this affirmation (as required in terms of Appendix 2 subsection (j) and (k) of GNR 982) that:

- i. To the best of my knowledge the information provided in this report is factually correct
- ii. To the best of my knowledge all relevant project information which has been provided to stakeholders and interested and affected parties (I&APs) is correct
- iii. All comments and inputs received from stakeholders / I&APs, prior to the submission of the Scoping Report, have been included as part of the Scoping Report and addressed where necessary
- iv. All responses provided to comments received from stakeholders / I&APs are the unbiased opinion of the EAP and are based on factually correct information
- v. The level of agreement between the EAP and stakeholder / I&APs in the Plan of Study for the undertaking of the Environmental Impact Assessment has been agreed upon.



Signature of the EAP

Signature - Commissioner of Oaths

WSP Environmental (Pty) Ltd

Company

Date

2 March 2017

Date

Stamp:

I certify that the DEPONENT has acknowledged that he/she knows and understands the contents of this affidavit, that he/she does not have any objection to taking the oath, and that he/she considers it to be binding on his/her conscience, and which was sworn to and signed before me

at BRYANSTON on this the 2<sup>nd</sup> day of MAR 2017.

**FRANCO JULYATE CA (SA)**

Member No: 20012720

WSP House, Bryanston Place, 199 Bryanston Drive, Bryanston  
PO Box 98867, Sloane Park 2152, South Africa

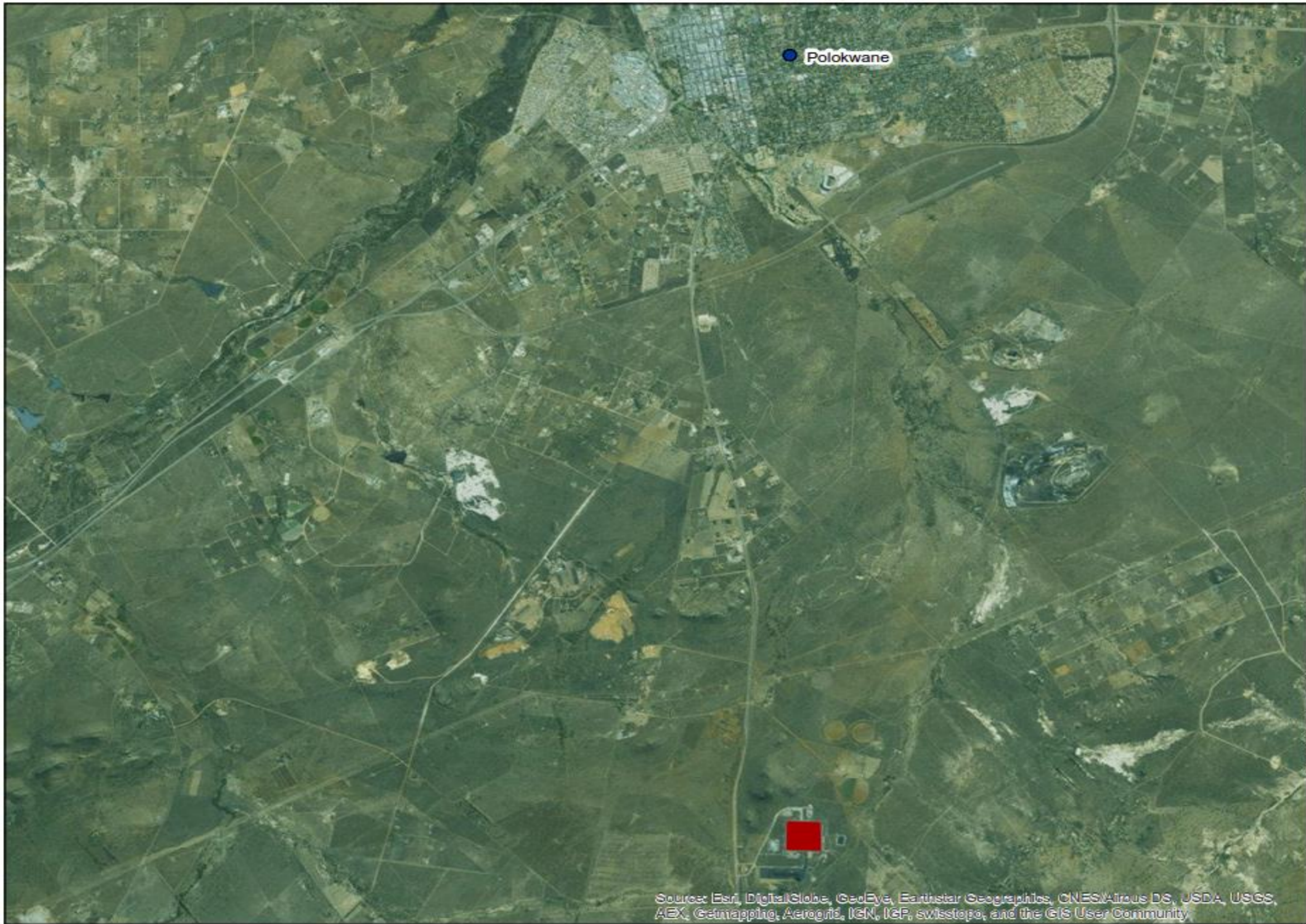
Directors:

SL Doel<sup>#</sup>(Managing), MC du Plooy<sup>\*\*</sup>, JH McStay<sup>#</sup>, ESBF Mtetwa\* (non-Executive)

# APPENDIX


## C LAYOUT PLANS

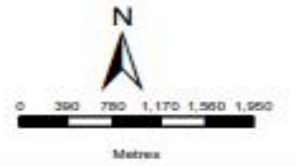




**ANGLO AMERICAN  
PLATINUM LIMITED**  
POLOKWANE SMELTER  
LOCATION

**Legend**

 Polokwane Smelter



DATA SOURCE: ARC GIS 10.2.2

PROJECTION: WGS 25 HARTBEESHOEK 1984

PROJECT TITLE: PROPOSED INSTALLATION OF SULPHUR  
DIOXIDE ABATEMENT EQUIPMENT AT ANGLO AMERICAN  
PLATINUM LIMITED - POLOKWANE SMELTER

PROJECT NO: 31102

SCALE: 1:95,000 AT A4

DATE: 7 OCTOBER 2016

DRAWN BY: ANNI SCHEEPERS

REVIEWED BY: NGEL SEED



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**DISCLAIMER**

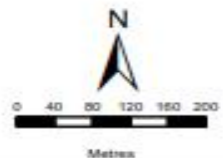
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Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



**ANGLO AMERICAN  
PLATINUM LIMITED**

Proposed Layout



DATA SOURCE: ARC GIS 10.2.2

PROJECTION: WGS 25 HARTBEESHOGK 1984

PROJECT TITLE: PROPOSED INSTALLATION OF SULPHUR DIOXIDE ABATEMENT EQUIPMENT AT ANGLO AMERICAN PLATINUM LIMITED: POLOKWANE SMELTER

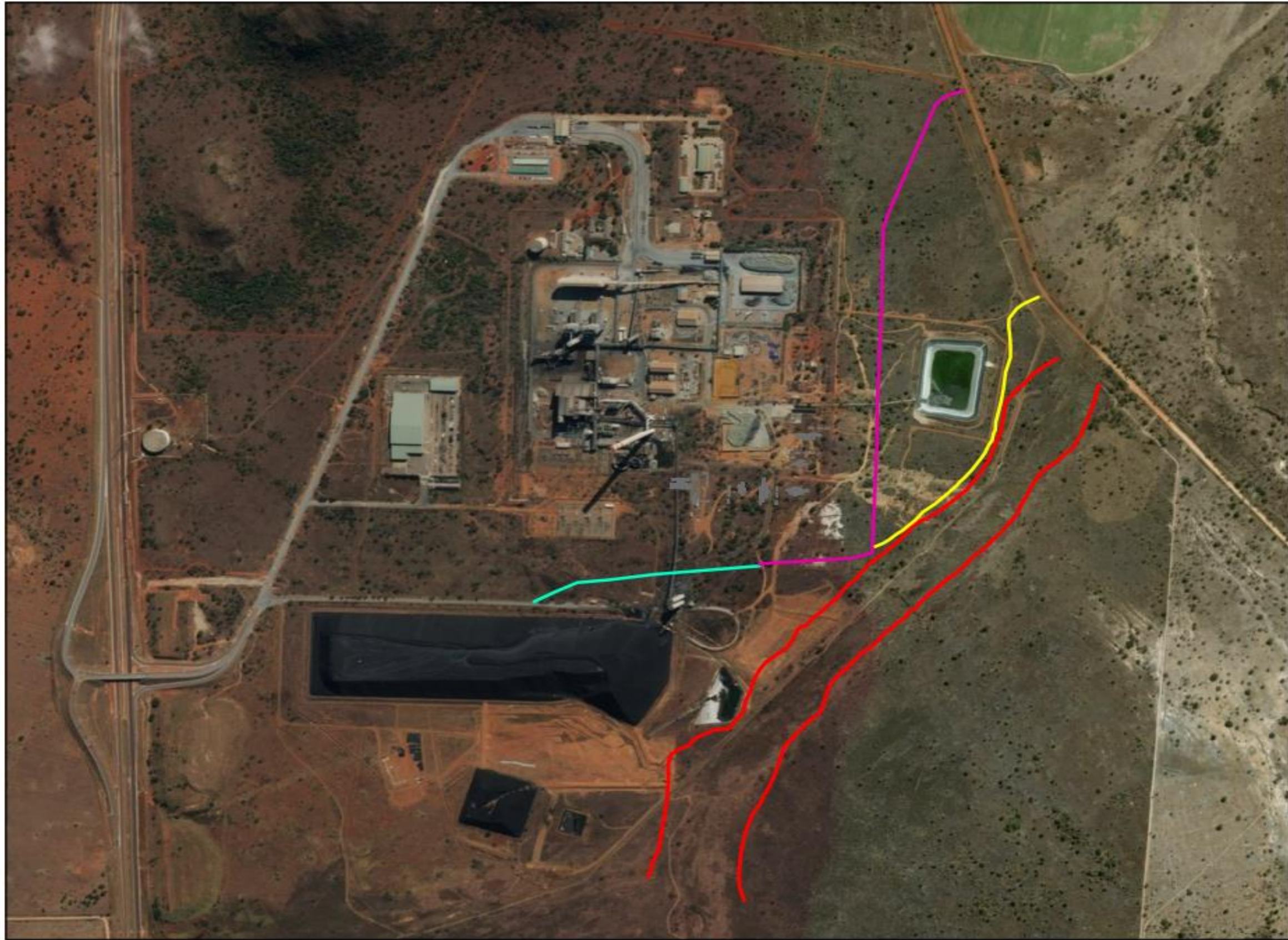
PROJECT NO: 31102

SCALE: 1:10,000 AT A4	DATE: 7 OCTOBER 2016
DRAWN BY: ANDR SCHEEPERS	
REVIEWED BY: NIGEL SEED	



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**ANGLO AMERICAN PLATINUM LIMITED**

**FINAL ACCESS ROUTES**

---

**Legend**

- Preferred Route
- Route Alternative 3
- Route Alternative 1
- 1:100 Year Floodline

---

0 40 80 120 160 200  
Metres

---

DATA SOURCE: ANC GIS 10.2.2

---

PROJECTION: WGS 25 HARTEBESHOEK 1984

---

PROJECT TITLE: PROPOSED INSTALLATION OF SULPHUR DIOXIDE ABATEMENT EQUIPMENT AT ANGLO AMERICAN PLATINUM LIMITED, POLOKWANE SMELTER

---

PROJECT NO: 31102

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SCALE: 1:10,000 AT A4	DATE: 7 OCTOBER 2016
DRAWN BY: ANM SCHEEPERS	
REVIEWED BY: NGEL SEED	

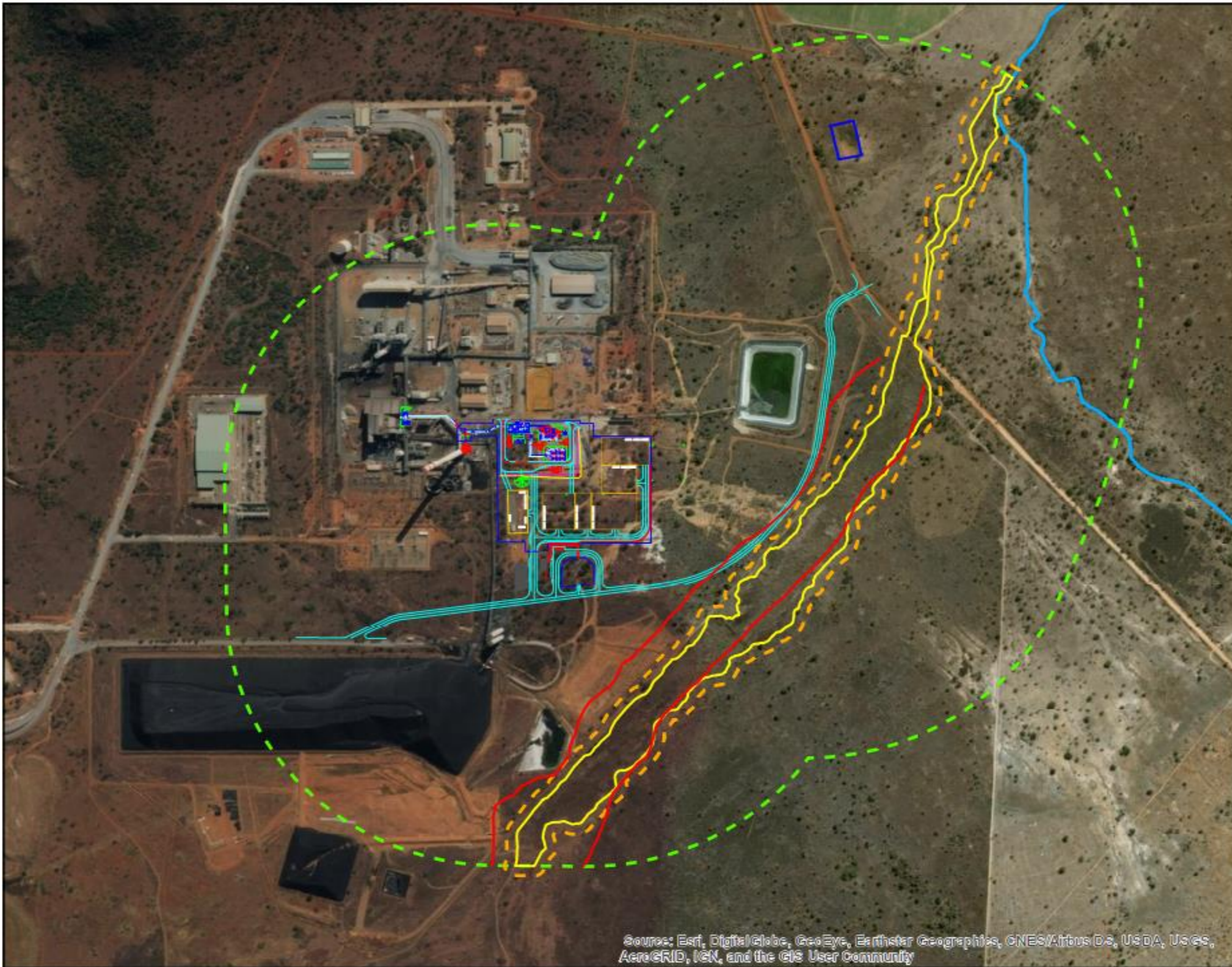
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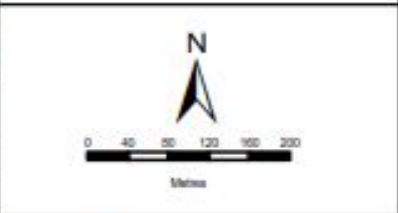
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**ANGLO AMERICAN PLATINUM**  
**FRESHWATER ECOSYSTEMS WITHIN 500M OF THE PROPOSED SO<sub>2</sub> SYSTEM**

- Legend**
- Sterkloopspruit
  - Floodlines from SRK 2012 Stormwater Management Plan
  - Channelled valley-bottom wetland (CVB)
  - Artificial excavation
  - 500m Buffer
  - 19m CVB Buffer



DATA SOURCE:  
 SOUTH AFRICAN DEPARTMENT OF RURAL DEVELOPMENT AND LAND REFORM-  
 CHIEF DIRECTORATE: NATIONAL GEO-SPATIAL INFORMATION  
 NFERA

PROJECTION: WGS 29 HARTEBEESHOEK 94

PROJECT TITLE:  
 SO<sub>2</sub> ABATEMENT PROJECT FOR POLOKWANE SMELTER

PROJECT NO: 31102\_7

SCALE: 1:9,300 AT A4      DATE: 2017/05/15

DRAWN BY: SABELO DUBE      FIGURE NO: 2

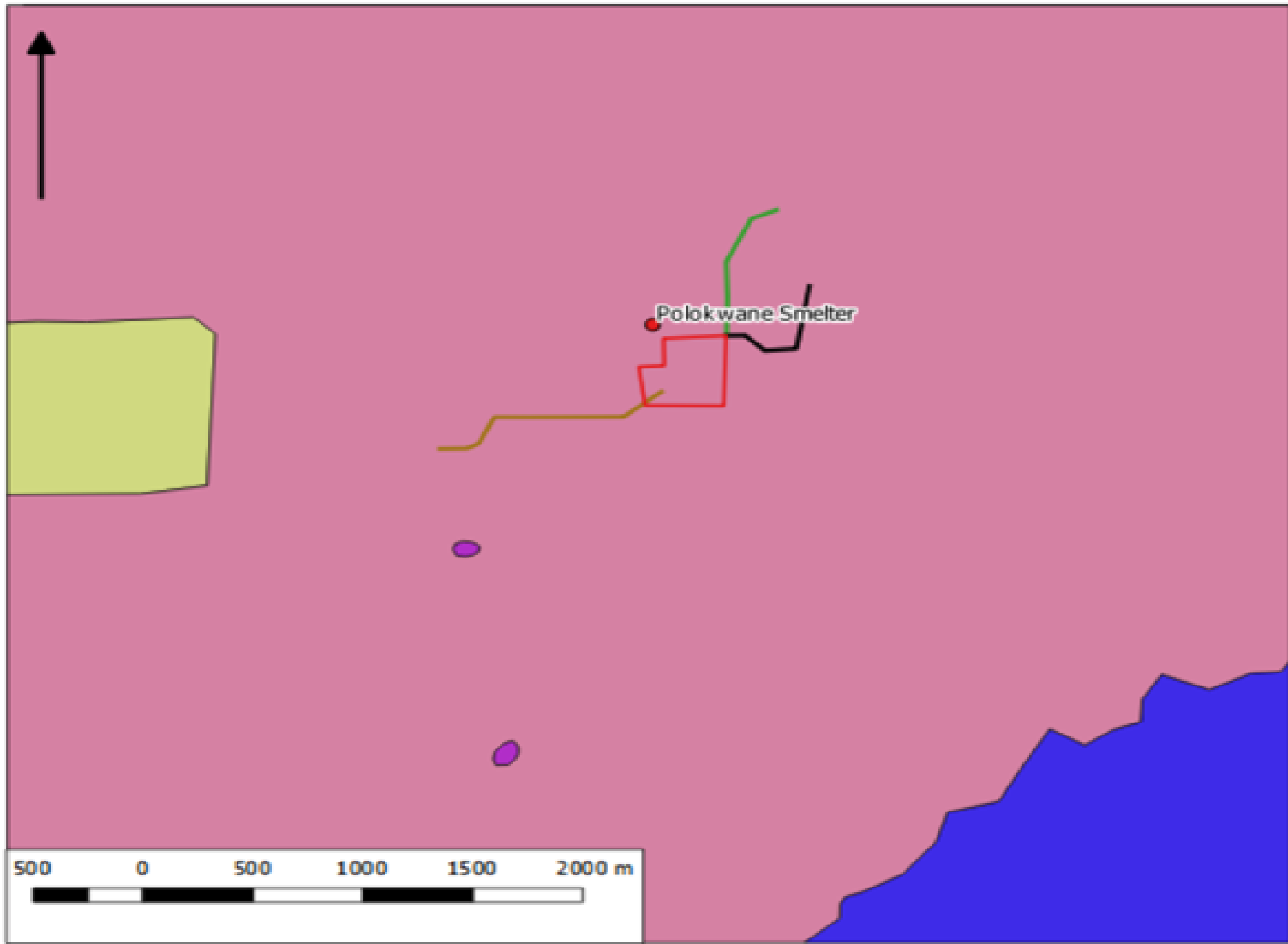
REVIEWED BY: ZAKARIYA NAKHOODA



**DISCLAIMER**  
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Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community





### Legend

- Project Area
- Proposed Road
- Road Alternative 1
- Road Alternative 2
- Polokwane Smelter

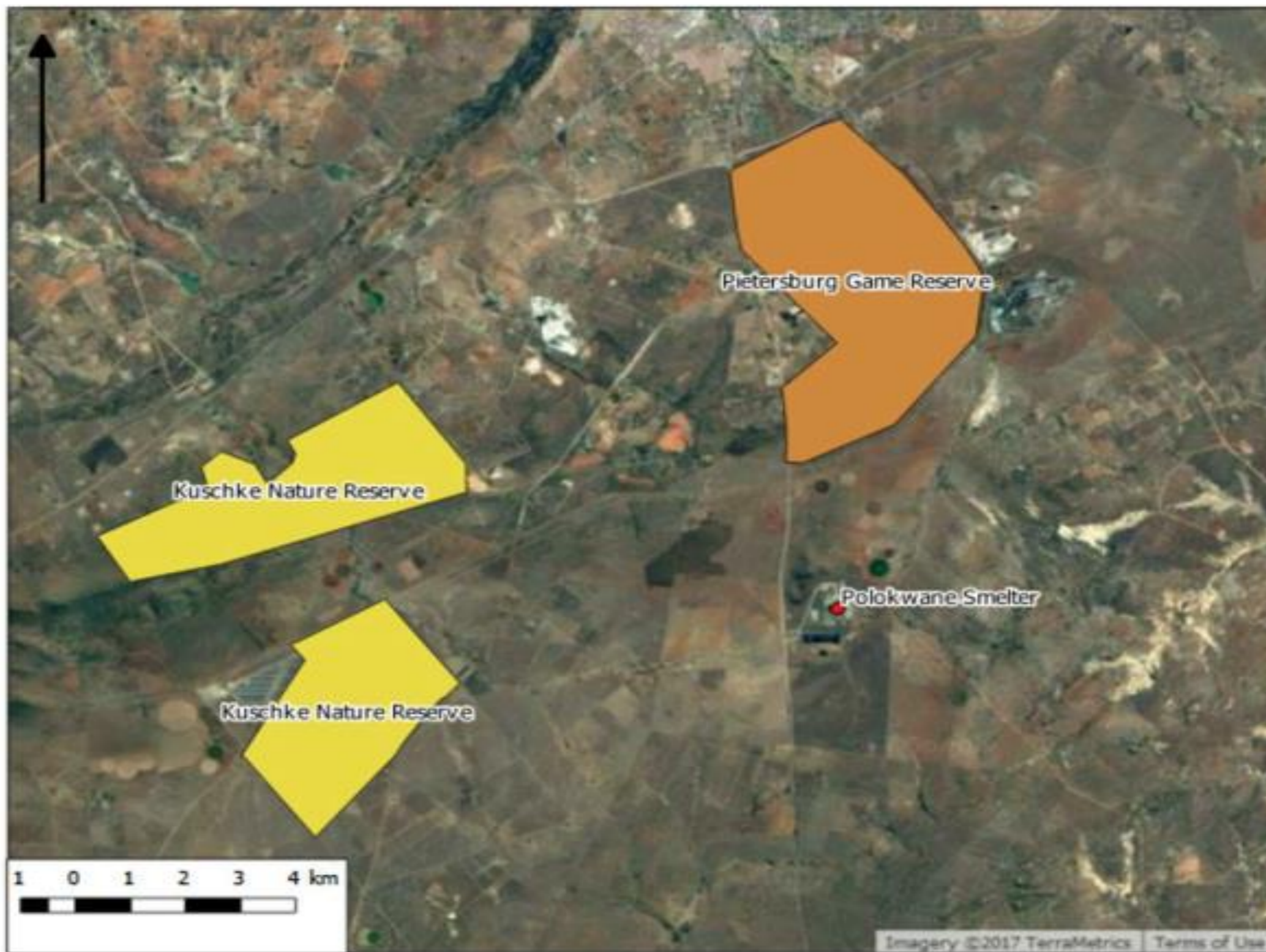
Limpopo Conservation Plan

- CBA1
- CBA2
- ESA1
- ESA2
- NNR
- CNA
- PA

Google Satellite

1:0





### Legend

- Project Area
- Proposed Road
- Road Alternative 1
- Road Alternative 2
- Polokwane Smelter
- Informal\_protected\_areas
- Pietersburg G Res
- Formal\_Protected\_Areas
- Kuschke Nat Res
- Google Satellite

1:0

### Provincial Context

A map of South Africa showing provincial boundaries. A red dot is placed in the northernmost province, indicating the location of the project area.

the **BIODIVERSITY** company