UNITED BY OUR DIFFERENCE

WSP

DRAFT SCOPING REPORT: THE RE-PROCESSING OF THE WATERVAL WEST AND EAST TAILINGS STORAGE FACILITIES

Anglo American Platinum Limited: Rustenburg Platinum Mines Limited

2012/10/05 Revised: 2012/11/01

Quality Management

Issue / revision	Issue 1		Revision 2	Revision 3
Remarks	Draft Scoping Report (final version for public review)			
Date	November 2012			
Prepared by	Brent Holme / Jared O'Brien			
Signature				
Checked by	Catherine Greengrass			
Signature				
Authorised by	Kim Allan			
Signature				
Project number	28006			
Report number	Draft 1			
File reference	Draft Scoping Report			

DRAFT SCOPING REPORT: THE RE-PROCESSING OF THE WATERVAL WEST AND EAST TAILINGS STORAGE FACILITIES

Anglo American Platinum Limited: Rustenburg Platinum Mines Limited

2012/10/05

Client

Anglo American Platinum Limited: Rustenburg Platinum Mines Limited
Anglo Platinum Management Services (Pty) Ltd
Western Limb Tailings Retreatment Facility Project

Consultant

WSP Environment and Energy
199 Bryanston Drive, Bryanston

Tel: +27 11 361 1395
Fax: +27 86 250 0693

www.wspenvironmental.co.za

Registered Address

WSP Environment & Energy South Africa
1995/008790/07
WSP House, Bryanston Place, 199 Bryanston Drive
Bryanston, 2191, South Africa

WSP Contacts

Catherine Greengrass
WSP Environment and Energy
Senior Environmental Consultant
Tel: 011 361 1395
Fax: 011 250 0693
Email: catherine.greengrass@wspgroup.co.za

Jared O'Brien
WSP Environment and Energy
Assistant Environmental Consultant
Tel: 011 361 1396
Fax: 086 505 3939
Email: jared.obrien@wspgroup.co.za

Executive Summary

Background Information

Anglo American Platinum Limited (AAP): Rustenburg Platinum Mines Limited (RPM), Rustenburg Operations, processes, refines and markets platinum and other platinum group metals (PGMs), as well as base metals. Mined ore is transported via road, rail and conveyer to the UG2 and Waterval concentrators where ore is crushed and mixed with water and reagents and sent as a slurry to Waterval Smelter. At the smelter the ore slurry is dried and smelted. Heavier components of the liquid ore are sent to the Base Metals Refinery and then to the Precious Metals Refinery. The remaining material, referred to as tailings is transported to a tailings storage facility (TSF). In the past, tailings was sent to the Klipfontein and Waterval West and Waterval East TSFs. These TSFs have however not been used since the mid-1990's.

Tests on the existing Klipfontein and Waterval TSFs conducted prior to July 2002 indicated that, due to improved treatment technologies, it would be possible to viably reprocess the deposited tailings materials to extract latent reserves still contained within the tailings (that were not previously viably extractable).

The re-processing of the Waterval TSFs, Klipfontein TSF and associated infrastructure (pipelines, new processing facility called the Western Limb Tailings Retreatment (WLTR) Plant, Hoedspruit TSF) was authorised by the Department of Minerals (DMR) as part of an amendment to the existing Environmental Management Programme (EMPR) in 2002. Although authorised, the re-processing of the Waterval tailings has not yet commenced. Recent changes to proposed infrastructure and the layout of the Waterval component of the project require the EMPR to be amended again.

The project has the potential to unlock approximately 88 million tons (Mt) of recoverable resource (74.5 Mt West Dam and 13.5 Mt East Dam), at an average grade of 1.08 grammes per tonne (g / t) with a recovery of 48%. Current indications are that this recover could return a net profit (over life of mine) of some R 8.2 billion.

Project Description

The proposed project is located 20 km east of Rustenburg, on the farms Waterval 303 JQ, Turfontein 302 JQ, Klipfontein 300 JQ, Brakspruit 299 JQ and Hoedspruit 298 JQ in the Rustenburg Local Municipality (RLM).

It is proposed that the Waterval TSFs be reclaimed using hydraulic techniques to sluice previously deposited, dry and compacted tailings material from the TSF and convey it, as a slurry via a proposed new pipeline, to the existing WLTR Plant.

The following infrastructure is proposed for the project (refer to **Figure 1**):

- Waterval TSFs (West and East)
  - Hydraulic reclamation equipment (high pressure water guns);
  - Drains, launders and filters, transporting slurry to the pre-treatment plant;
  - Pre-treatment plant, including pump station, slurry receiving facility, screening, storage, thickening and water recovery, surge tanks, pollution control dam (PCD) and transfer pumps in series;
  - Stormwater systems;
  - Administration buildings, including change houses and ablution facilities;
  - Access roads, routed from existing entry points;
  - Power supply;
  - Potable water pipeline; and
  - Construction contractors yards (temporary facilities).

- Pipeline
  - Overland slurry pipeline of approximately ± 12 km in total length from the Waterval TSF's to the WLTR Plant;
  - Overland return water pipeline of approximately ± 15 km in total length from WLTR to the Klipgat Return Water Dam;
  - Booster station, spillage handling system and pumps; and
  - Power supply.
- WLTR Plant
  - Additional storage facility; and
  - Four additional IsaMills™ within the Mainstream Inert Grinding (MIG) applications.
- Hoedspruit TSF
  - Installation of new pumps at the existing Hoedspruit pump station; and
  - Changes to the currently approved height of the Hoedspruit TSF may be required and will be investigated in the EIA Phase.

Power is available in close proximity to all preferred sites and sufficient demand is available. Furthermore, potable water is within reasonable proximity to the sites. Connection to sewage infrastructure is, however, not available in the vicinity of the Waterval TSF's and of the proposed booster station, therefore septic tanks systems (with soak-aways) are proposed for ablution facilities in these areas.

Project Alternatives

During the Pre-feasibility Phase of the proposed project, which precedes the current phase (Feasibility Phase), options relating to various aspects of the proposed project were considered and assessed in terms of their feasibility and the most suitable options selected. Alternatives that were considered as part of the Pre-feasibility Study included:

- Pipeline route;
- Pipeline installation and crossings;
- Water reclamation;
- Re-processing alternatives; and
- The no-go (no development) alternative.

The above-mentioned alternatives are described in order to provide an understanding of how the most feasible (preferred) alternatives were determined prior to initiating the Scoping and EIA process. Any additional alternatives identified as part of the Feasibility Phase with be included and assessed in the Environmental Impact Report (EIR).

Governance Framework

Legislation applicable to the proposed development was identified and reviewed. Key applicable legislation is presented in the executive study [refer to the main report (**Section 5**) for the full legal review].

- **Minerals and Petroleum Resources Development Act (No. 28 of 2002) (MPRDA)**

  The re-processing of the Waterval TSFs, Klipfontein TSF and associated infrastructure (pipelines, WLTR, Hoedspruit TSF, etc.) was authorised by the DMR as part of an amendment to the existing Environmental Management Programme (EMPR) in 2002. Although authorised, the re-processing of the Waterval tailings facility has not yet commenced. Recent changes to proposed infrastructure and the layout of the Waterval component of the project require the EMPR to be amended again.

- **National Environmental Management Act (No. 107 of 1998) (NEMA)**

  The NEMA activities, from Government Notice (GN) 544, potentially applicable to the proposed project are listed below:

  - Activity 9: The construction of facilities or infrastructure exceeding 1000 metres in length for the bulk transportation of water, sewerage or storm water-
    I. With an internal diameter of 0.36 metres or more; or
    II. With a peak throughput of 120 litres per second or more,
  - Activity 10: The construction of facilities or infrastructure for the transmission and distribution of electricity (i) outside urban areas or industrial complexes with a capacity of more than 33 kV but less than 275 kV; or (ii) inside urban areas or industrial complexes with a capacity of 275 kV or more.
  - Activity 11 (iii):The construction of bridges or infrastructure where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line.
  - Activity 18 (i): The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock or more than 5 cubic metres from a watercourse;
  - Activity 22: The construction of a road, outside urban areas,
    I. With a road reserve wider than 13.5 metres or,
    II. Where no reserve exists where the road is wider than 8 metres.
  - Activity 23: The transformation of undeveloped, vacant or derelict land to-
    I. Residential, retail, commercial, recreational, industrial or institutional use, inside an urban area, and where the total area to be transformed is 5 hectares or more, but less than 20 hectares, or
    II. Residential, retail, commercial, recreational, industrial or institutional use, outside an urban area, and where the total area to be transformed is bigger than 1 hectare but less than 20 hectares.
  - Activity 47: The widening of a road by more than 6 meters, or the lengthening of a road by more than 1 kilometre – (i) where the existing reserve is wider than 13.5 meters; or (ii) where no reserve exists, where the existing road is wider than 8 meters – excluding widening or lengthening occurring inside urban areas.

  The activity listed in GN 545 associated with the proposed project is Activity 6 (ii): The construction of facilities or infrastructure for the bulk transportation of dangerous goods – In liquid form, outside an industrial complex, using pipelines, exceeding 1000 metres in length, with a throughput capacity of more than 50 cubic metres per day. Application for environmental authorisation for activities listed in GN 545 requires that a Scoping and Environmental Impact Assessment (EIA) process be undertaken. The provincial department responsible for the authorisation will be the North West Department of Economic Development, Environment, Conservation and Tourism (NWDEDECT) and application for authorisation was submitted to this department on 21 August 2012 (**Appendix 1**).

- **National Water Act (No. 36 of 1998) (NWA)**

  The following activities are considered relevant to the proposed re-processing of the Waterval TSFs project:

  - 21 (c): impeding or diverting the flow of water in a watercourse;
  - 21 (i): altering the bed, banks, course or characteristics of a watercourse; and
  - 21 (g): disposal (storage) of water containing waste.

  An Integrated Water Use Licence (IWUL) in terms of the National Water Act (36 of 1998) was attained by RPM for all its existing water uses in March 2012, which includes existing river crossings and water storage. Consultation with the Department of Water Affairs (DWA) will be conducted to determine if the

existing IWUL can accommodate the inclusion of the proposed new slurry pipeline at existing licenced crossings. The process for amending the IWUL will be to update the existing Integrated Water and Waste Management Plan (IWWMP) for the RPM and submit this to the DWA for its consideration.

Scoping Process

Environmental authorisation is required prior to the commencement of the proposed project in accordance with the NEMA and MPRDA. A full Scoping and EIA process will be undertaken for the project and will be compiled in accordance with both the requirements of the NEMA EIA Regulations of 2010 and the MPRDA. The purpose of the scoping report is to identify the baseline environmental and socio-economic conditions of the proposed project site, provide an opportunity for the public to comment on the proposed project, and assess the potential impacts / risks associated with the proposed Project.

The environmental scoping phase was undertaken in line with the requirements of the NEMA EIA Regulations as well as the MPRDA. The objectives of the scoping phase are to:

- Ensure that the process is open and involves the applicant, authorities and stakeholders;
- Provide details of the Environmental Assessment Practitioner (EAP) who compiled the report and the relevant experience to carry out scoping procedures;
- Describe the proposed project;
- Identify feasible alternatives that can be selected for further assessment;
- Identify and describe the environment that may be affected by the activity and the manner in which the physical, biological, socio-economic and cultural aspects of the environment may be affected;
- Description of the environmental issues and potential impacts, including cumulative impacts;
- Provide information on the methodology that will be adopted in assessing the potential impacts during the EIA process;
- Provide details of the stakeholder engagement process followed;
- Comply with the relevant environmental legislation; and
- Provide a plan of study for the EIA.

An important part of any scoping phase is the stakeholder engagement process. The stakeholder engagement was initiated from the onset of the project to ensure that all stakeholders were adequately and effectively consulted, in order to:

- Inform, raise awareness, educate and increase understanding of a broad range of stakeholders about the project, affected environment and the environmental process to be followed;
- Establish lines of communication between authorities, stakeholders and the project team;
- Provide ample opportunity for all parties to exchange information and express their views and concerns;
- Obtain contributions of stakeholders and ensure that all issues, concerns and queries raised were fully documented; and
- Identify all the significant issues pertaining to the project.

Public Participation Process

In meeting the above requirements, the following activities will be undertaken as part of the stakeholder engagement:

- Newspaper advertisements in the Daily Sun and Rustenburg Herald on 29 November 2012;
- Site notices in and around the project area on 28 November 2012;

- Written notification letters to surrounding landowners and municipal ward councillors 27-29 November 2012; and
- Distribution of the BID to stakeholders 28 -29 November 2012.

A Public meeting and additional focus group meetings will be held in order to outline the details of the project to stakeholders and provide an opportunity for stakeholders to raise questions and indicate potential issues or risks associated with the project. Stakeholders are therefore invited to attend a public meeting at the Tshukudu High School on Wednesday the 16th of January 2013 from 16:00pm to 17:30pm.

- Copies of the Scoping Report will be made available for public review at the following venues from 29 November to 27 January 2012:
  - WLTR Plant entrance (coordinates: 25° 41' 24.16"S 27° 23' 47.53"E);
  - UG2 Concentrator Reception (coordinates: 25°40' 11.85"S 27° 19' 08.65"E);
  - Thlabane Public Library in Rustenburg (coordinates: 25° 38' 20.95"S 27° 12' 55.74"E);
  - Rustenburg Local Municipality (coordinates: 25° 40' 21.48"S 27° 14' 35.02"E);
  - Mfidikwe Primary School (coordinates: 25° 39' 48.24"S 27° 20' 31.75"E);
  - Thekwane Thlage Primary School (coordinates: 25° 39' 29.15"S 27° 22' 00.81"E); and
  - WSP Environment and Energy website (www.wspenvironmental.co.za).

Detailed information is provided in the main report (refer to **Section 6**). Alternatively, should you require directions to one of the above venues or wish to submit your comments, kindly send these to WSP. All concerns, comments, viewpoints and questions (collectively referred to as 'issues') will be documented and responded to adequately in the Issues Trail.

Potential Environmental Impacts

The over-arching objective of the Scoping Phase is to identify record and describe the *potential* environmental impacts associated with the proposed project. This enables the specialist studies to clearly focus on aspects of significant concern. It also provides a framework for the assessment of the impacts that the proposed project will have on the environment, and of the impacts the environment will have on the proposed project. Based on inputs from the project team, stakeholders (I&APs) and specialists the environmental (biophysical and social) impacts in **Tables 1, 2 and 3** have been identified as potentially relevant to the proposed development and will be investigated during the EIA phase of the process.

Table 1: Potential Bio-physical Impacts

Environmental Aspect	Potential Impact	Proposed method of investigation
Soils, Land Use and Land Capability	Loss of grazing capacity along pipeline route.	Assessment of significance in the EIA phase
	Loss in agricultural potential along pipe-line	
	Obstacles to movement of people and livestock due to overland pipeline	
	Potential for spills of fuels and other chemicals during construction and opera-tion	
	Pipeline leaks during operation	
Biodiversity	Loss of terrestrial habitat	Aquatic Ecology Assessment and assessment of significance in the EIA

Environmental Aspect	Potential Impact	Proposed method of investigation
	Loss of aquatic / wetland habitat and habitat for bird species	phase
	Disturbance and displacement of fauna / avifaunal species	
	Faunal interaction with structures, servitudes and personnel	
	Impact on surrounding habitat and species	
	Increase in environmental degradation	
	Introduction / spread of alien species	
	Loss of species diversity	
Surface and Groundwater	Soil erosion from changes in surface water flow due to construction of infrastructure	Study to update existing surface water information and assessment of significance in the EIA phase
	Surface water pollution due to spills of fuels or chemicals during construction and operation	
	Removal of vegetation on the TSFs prior to reclamation may increase surface water runoff as well as the entrainment of tailings materials into the surface water and final deposition and sedimentation of the Klipgat Return Water Dam	
	Positive impact of the reduction of tailings volume due to reprocessing thereby reducing the potential impacts / risks to ground water at final mine closure in the future.	
Air Quality	Particulate matter (dust) impacts from the Waterval TSF during construction phase due to removal of vegetation on the TSF prior to reclamation.	Air Quality Impact Assessment
	Particulate matter from the Hoedspruit TSF during operation, where the tailings from the WLTR are deposited	
Traffic	Construction vehicles using the existing road networks to access the proposed site and pipeline route	Traffic Impact Assessment
	Increase in the number of vehicles on the existing networks during operational phase	
	Loss of cultural / heritage resources	

Table 2: Potential Social Impacts

Environmental Aspect	Potential Impact	Proposed method of investigation
Visual	Visual impact associated with construction vehicles and activities on site	Assessment of significance in the EIA phase
	Impact of the overland pipeline, pre-treatment plant and pollution control dams.	
	Should an increase to the approved height of the Hoedspruit TSF be required, there may be an associated visual impact.	
Noise	Noise impact during construction of the pipeline, pre-treatment plant, pollution control dam and booster station.	Project will be considered in terms of noise standards applicable to mine lease area and rural / residential areas and assessment of significance in the EIA phase
	Noise from Isa Mills	
Safety	Safety of employees at the reclamation site.	Assessment of significance in the EIA phase
	Safety of employees and public along pipeline route during construction	
	Road Safety: Increase in construction trucks / heavy vehicles on public roads	
Culture and Heritage	Impacts on previously unknown heritage / cultural / archaeological resources that may be un-earthed during construction	Review of existing heritage / cultural information and assessment of significance in the EIA phase
Socio-Economic	Job creation	Social Impact Assessment
	Expansion of local skills	
	Local procurement opportunities	
	Economic development	
	Impact on grazing activities	
	Security / safety risks of the public	
	Noise intrusion	
	Dust intrusion	
	Light intrusion	
	Increased potential for fires	
	Influx of people resulting in increase in informal settlements and additional pressure on existing facilities and resources.	
	Cracking of houses due to vibrations during construction activities such as ground compaction.	
	Restriction of access to facilities and resources such as grave yard, grazing land, places of work etc.	

Cumulative impacts are regarded as the incremental and combined effects of human activity that pose a significant threat to the environment. Cumulative impacts accrue over time, from one or more sources, and can result in the degradation of valuable resources. Potential cumulative impacts have been identified and are presented in **Table 12**.

Table 3: Potential Cumulative Impacts

Aspect	Impacts	Cause
Climate	▪ Release of greenhouse gas emissions	▪ Land based vehicle activity ▪ Increased electricity use
▪ **Air quality**	▪ Degradation of air quality	▪ Dust pollution from tailings
▪ **Hydrology**	▪ Surface water pollution ▪ Aquatic systems (ecosystem functioning)	▪ Soil erosion ▪ Soil contamination by chemicals and hydrocarbons
▪ **Geohydrology**	▪ Groundwater pollution	▪ Groundwater contamination from the TSF
▪ **Socio-Economic**	▪ Safety ▪ Aesthetics	▪ Increases to existing activities in the area (movement of vehicles) ▪ Adding to the already built up nature of the environment
▪ **Socio-Economic**	▪ Regional economic benefit	▪ Generation of new employment

Plan of Study for the EIA

The purpose of the Plan of Study for the EIA is to detail the approach that the EAP will take towards the EIA / EMPR process, which will be approved or authorised by the DMR (as an EMPR amendment document) and the NW DEDECT [as an (EIR)]. The following will be undertaken as part of the EIA and the EMPR Amendment Phases:

- **Project description** - A detailed project and location description will be developed
- **Specialist studies** - five specialist studies have been identified to date, which include, but may not be limited to:
  - Traffic Impact Assessment;
  - Air quality impact assessment;
  - Aquatic ecological impact assessment;
  - Hydrological assessment; and
  - Social-economic impact assessment.
- **Impact Assessment** – the potential environmental impacts associated with the proposed Project will be evaluated according to their significance, which is determined as a result of the consequence and likelihood. The consequence is determined as a function of the severity, duration, and spatial scale, whereas the likelihood of the impact is determined as a function of the frequency of the activity and frequency of the risk / impact. The consequence multiplied by the likelihood presented the significance of the potential impact. All impacts will be assessed with and without management measures in place
- **Preparation of EIR and EMPR** – an EIR and a draft EMPR will be compiled in accordance with the NEMA EIA Regulations and the MPRDA. The draft EMPR will provide the actions for the management of identified

environmental impacts emanating from the proposed project and a detailed outline of the implementation programme to minimise and / or eliminate the anticipated negative environmental impacts.

- **Public participation** – the EIR and a draft EMPR will be made available for public and state department review for a period of 40 days. Stakeholders will have the opportunity to view the draft reports and submit their comments, issues and concerns to WSP. Comments from the public review period will be incorporated into a finalised report that is submitted to NWDEDECT and DMR for review and authorisation.
- **Public participation** – all registered stakeholders will be notified of the authority decision towards authorisation of the proposed project and notified of the appeal process in accordance with the NEMA EIA Regulations of 2010.

Conclusion

On conclusion of the public review of the draft Scoping Report, the report will be submitted to the DEA and the DMR for acceptance, review and approval. The EIA Phase will then commence and will entail detailed investigations into the impacts identified and will serve also to guide the design processes for the project in order to present the most environmentally feasible options for the proposed project.

Throughout the process stakeholders and I&APs will be engaged to ensure that their comments and concerns are taken into consideration and that they form an integral part of the environmental authorisation process

Table of Contents

List of Appendices

List of Figures

List of Tables

Abbreviations and Acronyms

Abbreviation / Acronym	Description
CA	Competent Authority
DMR	Department of Mineral Resources
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EIR	Environmental Impact Report
EMPR	Environmental Management Program
FRAI	Fish Response Assessment Index
I&AP	Interested and Affected Party
IWWMP	Integrated Water and Waste Management Plan
IWUL	Integrated Water Use Licence
IHI	Index of Habitat Integrity
kt	Kilotonnes (1000 tonnes)
Kt / m	Kilotonnnes per month
MVA	Megavolt Ampere
Mt	Million tons
MPRDA	Minerals and Petroleum Resources Development Act 28 of 2002
NEMA	National Environmental Management Act 107 of 1998
NEMWA	National Environmental Management: Waste Act 59 of 2008
NWA	National Water Act 36 of 1998
NWDEDECT	North West Department of Economic Development, Environment, Conservation and Tourism.
PCD	Pollution Control Dam
PES	Present Ecological Status
PGE	Platinum Group Elements
PGM	Platinum Group Metals
RHP	River Health Programme
RLM	Rustenburg Local Municipality
RPM	Rustenburg Platinum Mines (Pty) Ltd
SEP	Stakeholder Engagement Plan
SIA	Social Impact Assessment
SASS5	South African Scoring System version 5
t	Tonnes
TSF	Tailings storage facility
WLTR	Western Limb Tailing Retreatment Facility/Plant
WUL	Water Use License

Glossary of Terms

Phrase	Definition
Air pollution	Any change in the composition of the air caused by smoke, soot, dust (including fly ash), cinders, solid particles of any kind, gases, fumes, aerosols and odorous substances.
Aquifer	A geological formation which has structures or textures that hold water or permit appreciable water movement through them.
Community	A Coherent, social group of persons with interests or rights in a particular area of land which the members have or exercise communally in terms of an agreement, custom or law (MPRDA).
Effluent	Any liquid, whether or not containing matter in solution or suspension
Environment	The surroundings within which humans exist and that are made up of - (i) the land, water and atmosphere of the earth; (ii) micro-organisms, plant and animal life; (iii) any part or combination of (i) and (ii) and the interrelationships among and between them; and (iv) the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and wellbeing (NEMA).
Environmental Assessment Practitioner	The individual responsible for the planning, management and coordination of environmental impact assessments, strategic environmental assessments, environmental management plans or any other appropriate environmental instruments introduced through regulations (NEMA, Ch. 5).
Environmental Impact Assessment	Means a systematic process of identifying, assessing and reporting environmental impacts associated with an activity and includes basic assessment and S&EIR (NEMA).
General waste	Waste that does not pose an immediate hazard or threat to health or to the environment, and includes a. Domestic waste; b. Building and demolition waste; c. Business waste; and d. Inert waste.
Hazardous waste	Any waste that contains organic or inorganic elements of compounds that may, owing to the inherent physical, chemical or toxicological characteristics of that waste, have a detrimental impact on health and the environment.
Interested and Affected Party	Any person, group of persons or organisation interested in or affected by such operation or activity; and any organ of state that may have jurisdiction over any aspect of the operation or activity (NEMA, Ch. 5).
Pollution	The direct or indirect alteration of the physical, chemical or biological properties of a water resource so as to make it- a. less fit for any beneficial purpose for which it may reasonably be expected to be used; or b. harmful or potentially harmful- i. to the welfare, health or safety of human beings; ii. to any aquatic or non-aquatic organisms; iii. to the resource quality; or iv. to property
Stakeholder	Persons or groups who are affected by or can affect the outcome of a project (e.g. commercial / industrial enterprises, academics, religious groups, media, NGOs, etc.).
Sewage	Waste water, industrial and commercial effluent, standard domestic effluent

	(soil water) and other liquid waste, either separately or in combination, but does not include stormwater.
Sewage disposal system	The structures, pipes, valves, pumps, meters or other appurtenances used in the conveyance of sewage through the sewer reticulation system and treatment thereof at a sewage treatment plant under the control of the Council or its authorised provider and which may be used by it in connection with the disposal of sewage.
State Department	Means any department or administration in the national or provincial sphere of government exercising functions that involve the management of the environment (NEMA, Chapter 1).
Stormwater	Any liquid resulting from natural precipitation or accumulation and includes rainwater, spring-water and ground-water.
Waste	Any substance, whether or not that substance can be reduced, reused, recycled and recovered – a. that is surplus, unwanted, rejected, discarded, abandoned or disposed of; b. which the generator has no further use of for the purposes of production; c. that must be treated or disposed of, or d. that is identified as waste by the Minister by notice in the Gazette, e. and includes waste generated by the reclamation / re-processing operation, medical or other sectors, but ▪ a by-product is not considered waste, and ▪ any portion of waste, once re-used, recycled and recovered, ceases to be waste any portion of waste, once re-used, recycled and recovered, ceases to be waste.
Water resource	Includes a watercourse (see definition), surface water, estuary, or aquifer.
Watercourse	a. A river or spring; b. A natural channel in which water flows regularly or intermittently; c. A wetland, lake or dam into which, or from which, water flows; and d. Any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse, e. And a reference to a watercourse includes, where relevant, its bed and banks.

1 Introduction

1.1 Background and Project Location

1.1.1 Background to Rustenburg Platinum Mines

Anglo American Platinum Limited (AAP): Rustenburg Platinum Mines Limited (RPM), Rustenburg Operations processes, refines and markets platinum and other platinum group metals (PGMs), as well as base metals. The intent to expand the production of PGMs and gold is aligned with AAP's objective of remaining the single leading producer of PGMs in the world. RPM is located in the North West Province, Bojanala Platinum District Municipality's area of jurisdiction, within the Rustenburg Local Municipality (RLM). RPM is approximately 20 kilometres (km) east of the town of Rustenburg and 60 km west of Brits (**Figure 1**).

RPM comprises the following reclamation and processing operations:

- Mining
  - Khuseleka Mine;
  - Thembalani Mine;
  - Khomanani Mine;
  - Siphumelele Mine; and
  - Bathopele Mine.
- Processing and refining
  - Waterval and UG2 Concentrators;
  - Waterval Smelter;
  - Rustenburg Base Metals Refinery; and
  - Precious Metals Refinery.
- Tailings storage facilities (TSFs)
  - Paardekraal TSF;
  - Klipfontein TSF (undergoing re-processing);
  - Waterval West TSF (dormant);
  - Waterval East TSF (dormant); and
  - Hoedspruit TSF.

Two separate ore bodies, namely the UG2 and Merensky, are being mined by RPM for the extraction of the PGMs, as well as gold and the associated base metals copper and nickel. The new order mining right for the area is 16 651.6 hectares (ha) with various mining methods such as hybrid, board and pillar, conventional stopping and trackless development. The mined ore is transported via road, rail and conveyer to the UG2 and Waterval concentrators, where the ore is crushed before being sent to a flotation process where reagents are added and flows to the Waterval Smelter as wet concentrate (slurry). On arriving at the Waterval Smelter the slurry is dried by the flash dryer plant to a bone-dry concentrate. The dry concentrate is melted in electric furnaces. During this process, the heavier high-value mineral content (matte) settles at the bottom of the furnace, while the lighter low-grade mineral content (slag) floats on top.

The matte is then transferred to the Rustenburg Base Metals Refinery (RBMR) where copper, nickel, cobalt and sodium sulphate are recovered. Thereafter, the PGMs are sent to the Precious Metals Refinery (PMR)

where valuable metals such as platinum, palladium, rhodium, iridium, ruthenium, osmium and gold are recovered.

Currently, underflow suspension from the Waterval and Frank concentrators is sent to the Paardekraal TSF, however, in the past it was sent to the Klipfontein and Waterval West and Waterval East TSFs. Tests on the existing Klipfontein and Waterval TSFs conducted prior to July 2002 indicated that, due to improved treatment technologies, it would be possible to viably reclaim and reprocess the deposited tailings materials to extract latent reserves still contained within the tailings that were not previously viably extractable (EMPR, 2002).

1.1.2 Background to the Proposed Project

RPM commenced with the re-processing of the Klipfontein TSF in December 2003 following necessary environmental authorisation (DMR Reference Number: RNW(KL) 6/2/2/3164, EMPR, 2002), and re-treating material at the Western Limb Tailings Retreatment (WLTR) Plant. The initial authorisation included the reclamation and re-processing of the Waterval East and West TSFs however, the Waterval component of the project was put on hold at the time.

The WLTR is thus currently processing reclaimed material from the Klipfontein TSF only, at a rate of 450 kt / m. The Klipfontein TSF is estimated to be depleted by mid-2015. RPM now intends to implement the Waterval re-processing phase as was previously intended. The Waterval re-processing phase will need to be implemented mid-2014 in order to overlap with the final stages of the Klipfontein tailings reprocessing as this supply will be intermittent in the last year before depletion. It is intended that the WLTR will operate at a higher production rate into the future, once the tailings from Klipfontein have be depleted.

This project therefore comprises the reclamation of the Waterval TSFs and conveyance to the WLTR for reprocessing, including associated infrastructure / activities. The Waterval TSFs, separated into West TSF and East TSF, have remained dormant since 1980 and 1995 respectively. Geological investigations undertaken in 2008, using sonic drilling, estimated the available resource concentrations at the West and East TSFs (**Table 1**).

Table 1: Waterval TSFs recoverable resources (TWP, 2012)

TSF	Density (t / m^3)	Volume of Material (m^3)	Tonnes of Material (t)	PGE[1] (g / t)
West	1.62	46,101,456[2]	74,541,208	1.08
East	1.67	8,117,320	13,518,829	1.05

The project has the potential to unlock approximately 88 million tons (Mt) of recoverable resource (74.5 Mt West Dam and 13.5 Mt East Dam), at an average grade of 1.08 grams per tonne (g / t) with a recovery of 48%. Current indications are that this recovery could return a net profit (over life of mine) of some R 8.2 billion.

1.1.3 Project Location

The proposed project is situated on the farms Waterval 303 JQ, Turfontein 302 JQ, Klipfontein 300 JQ, Brakspruit 299 JQ and Hoedspruit 298 JQ in the RLM. **Figure 1** represents the location of the proposed project in relation to surrounding towns which are tabulated in **Table 2** (refer to **Appendix 1** for Surveyor General Codes of the affected properties). The following table details relevant location information:

Table 2: Details of Location Setting

Aspect	Detail
Magisterial district and local municipality	Rustenburg Local Municipality

[1] Platinum Group Elements (PGE), containing platinum, palladium, rhodium and gold. Although not PGEs, copper and nickel comprise a percentage of the tailings.

[2] It was noted by Fraser Alexander that approximately 718,531 m^3 of the calculated 46,101,456 m^3 have been previously removed from the West Dam and used as backfill material by RPM.

Aspect	Detail
	Bojanala Platinum District Municipality
Directions and distances to surrounding towns	Rustenburg: 20 km west
	Brits: 60 km west
	Pretoria: 110 km east
	Johannesburg: 140 km southeast
	Thabazimbi: 150 km north
Roads, railway lines and power lines in vicinity	Roads: R108, R27, R30, R510, R24
	Railways: SATS to Pretoria and Thabazimbi
Surface Water in Crocodile Catchment Area	Hex River
	Elandsrivier
	Klipgatspruit

1.1.4 Land ownership

The project is located primarily within the RPM mine lease area however; certain components of the project are located on land not owned by the applicant (RPM). Landownership for affected portions is as follows:

Table 3: Land ownership

Farm Name	Portion	SG 21	Land Owner
Waterval 303 JQ	19	T0JQ00000000030300019	RPM
Waterval 303 JQ	Remainder	T0JQ00000000030300000	RPM
Waterval 303 JQ	10	T0JQ00000000030300010	RPM
Waterval 303 JQ	13	T0JQ00000000030300013	RPM
Waterval 303 JQ	50	T0JQ00000000030300050	RPM
Waterval 303 JQ	15	T0JQ00000000030300015	RPM
Waterval 303 JQ	47	T0JQ00000000030300047	RPM/RLM
Klipfontein 300 JQ		T0JQ00000000030000006	Makhatle Tribe (RBH)
Hoedspruit 298	19	T0JQ00000000029800019	RPM
Hoedspruit 298	5	T0JQ00000000029800000	RBH
Hoedspruit 298	Remainder (formerly Portion 4)	T0JQ00000000029800000	Fike Trust (RBH)
Turfontein 302 JQ		T0JQ00000000030200000	RBH
Brackspruit 299 JQ	7	T0JQ00000000029900007	RPM
Anglo Tailings 942 JQ	(formerly Portion 18 of Hoedspruit 298)	T0JQ00000000029800018	RPM

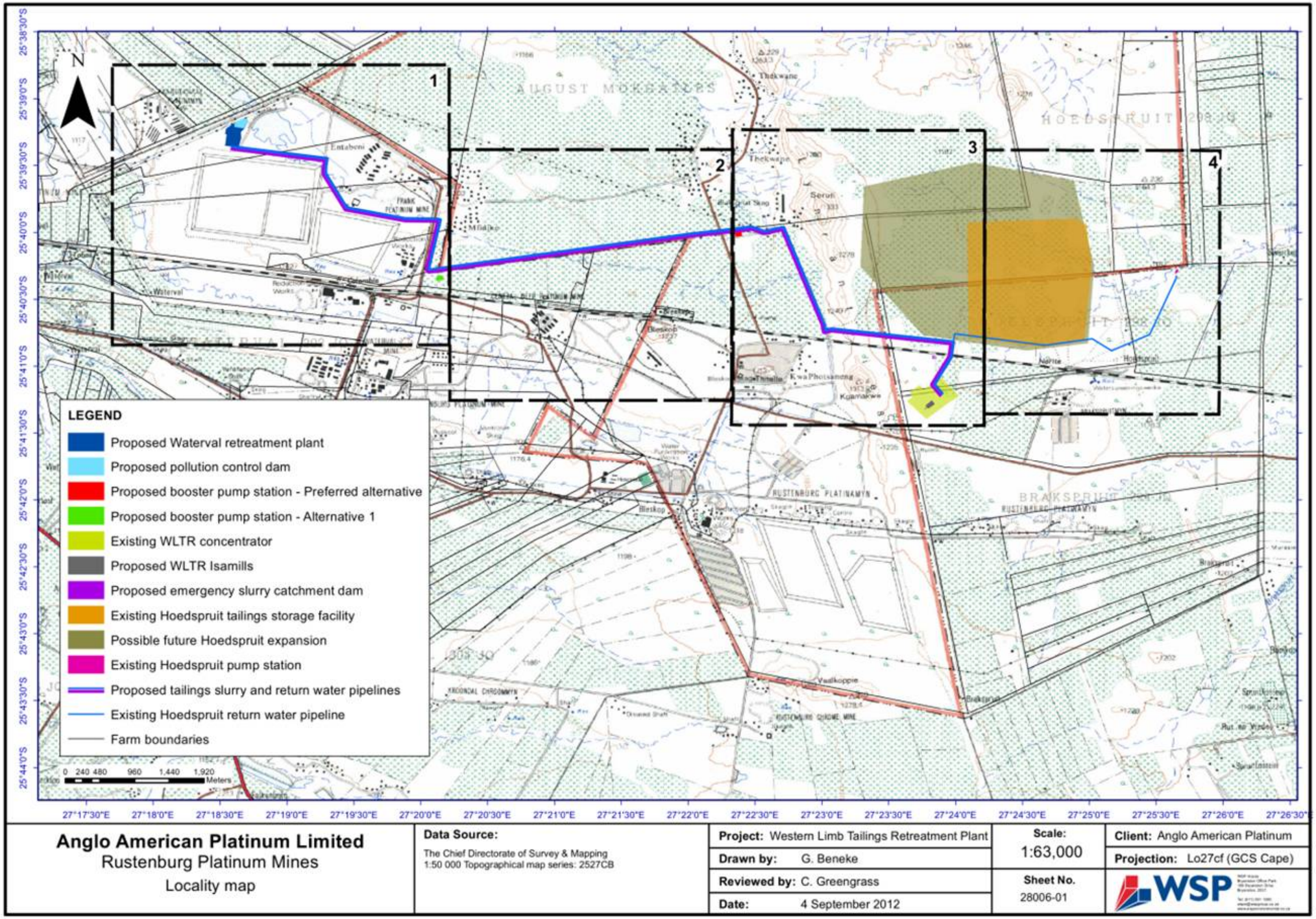


Figure 1: Locality Map

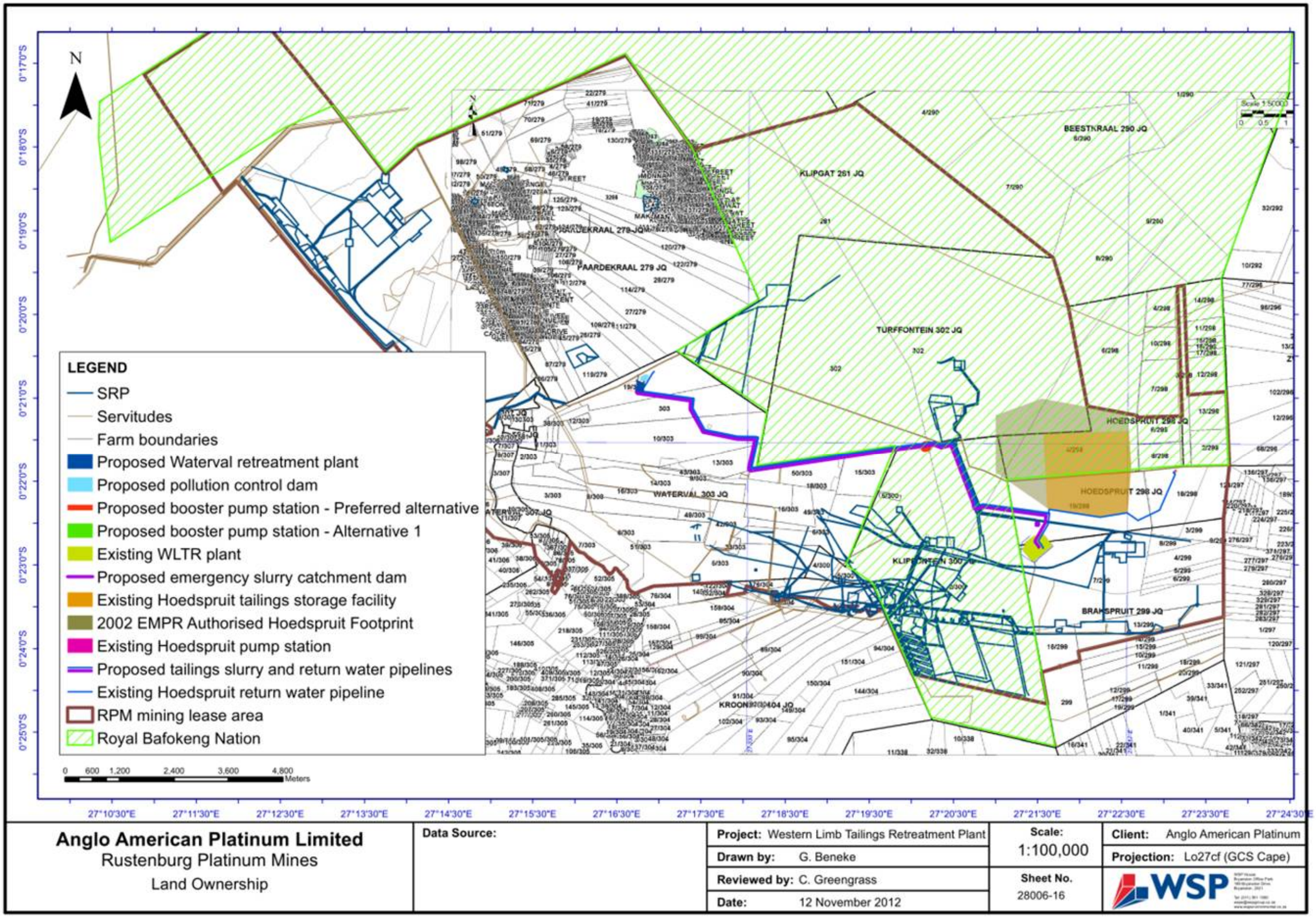


Figure 2: Landownership Map

1.2 Scope of Work for the Proposed Project

It is proposed that the Waterval TSFs be reclaimed using hydraulic reclamation techniques. Hydraulic reclamation is the process whereby previously deposited, dry and compacted tailings material is hydraulically sprayed or 'sluiced' from the dam face where after it will be pumped, as slurry, via pipelines to the existing WLTR Plant. The following site infrastructure and structures will be constructed and / or installed for the proposed project. **Figure 1** to **Figure 6** illustrates the footprint of proposed infrastructure (refer to **Section 2** for a detailed project description):

- Waterval TSFs (West and East)
  - Hydraulic reclamation equipment (high pressure water guns);
  - Drains, launders and filters, transporting slurry to the pre-treatment plant;
  - Pre-treatment plant , including pump station, slurry receiving facility, screening, storage, thickening and water recovery, surge tanks, pollution control dam (PCD) and transfer pumps in series;
  - Stormwater systems;
  - Administration buildings, including change houses and ablution facilities;
  - Access roads, routed from existing entry points;
  - Power supply;
  - Potable water pipeline; and
  - Construction contractors yards (temporary facilities).
- Pipeline
  - Overland slurry pipeline of approximately ± 12 km in total length from Waterval TSF's to the WLTR;
  - Overland return water pipeline of approximately ± 15 km in total length from Hoedspruit to Klipgat Return Water Dam;
  - Booster station, spillage handling system and pumps; and
  - Power supply.
- WLTR Plant
  - Additional storage facility; and
  - Four additional IsaMills^{TM} within the Mainstream Inert Grinding (MIG) applications.
- Hoedspruit TSF
  - Installation of new pumps at the existing Hoedspruit pump station;
  - Changes to the approved height of the Hoedspruit TSF may be required and will be investigated in the EIA Phase.

It should be noted that apart from the existing WLTR Plant, the property required for the construction and installation of the pre-treatment plant, the pipeline and the booster station is currently undeveloped.

According to TWPs prefeasibility study report (2012), power is available in close proximity to all preferred sites and sufficient demand is available. Furthermore, potable water is within reasonable proximity to the sites. Connection to sewage infrastructure is, however, not available in the vicinity of the Waterval TSF's and of the proposed booster station. Septic tanks systems (with soak-aways) are therefore proposed to provide for provision of ablution facilities in these areas.

Prior to the commencement of any activity associated with the proposed re-processing project, environmental authorisation will need to be obtained in accordance with the National Environmental Management Act (No. 107 of 1998) (NEMA), as amended and the Minerals and Petroleum Resources Development Act (No. 28 of 2002) (MPRDA). WSP Environment and Energy (WSP) has been appointed by RPM as the independent

environmental assessment practitioner (EAP) to undertake the necessary environmental authorisation processes.

1.3 Motivation

The Waterval TSF project is required in order to extend the operation of the WLTR Plant for the following key reasons:

- Klipfontein TSF is nearing depletion and will be completely depleted by 2015.
- 88 million tons of recoverable resource is available as West and East TSFs with a product recovery rate of 48%.
- Should the tailings not be reclaimed and reprocessed, this resource will otherwise remain unutilised.
- Should the tailings not be reclaimed and re-processed the TSFs will be dealt with as a risk / liability in terms of current rehabilitation and mine closure requirements. If the project goes ahead, the reprocessing process will result in tailings that will be stored at Hoedspruit TSF, along with tailings from various other RPM processes. The intention, when Hoedspruit TSF was designed and implemented, was to provide on large central (consolidated) tailings facility and thus reduce the number of smaller facilities in the area, thereby reducing the total tailings footprint of the RPM, as well as the associated environmental impacts / liabilities.
- The continuation of reclamation and re-processing of tailings at RPM will ensure the continuation of employment for those currently working on the Klipfontein reclamation and re-processing project.
- A small number of new employment opportunities are envisaged.

Furthermore, platinum demand is expected to grow about 4% per year (2010 – 2020) over the long-term. Demand will be driven by the use in the following sectors (TWP, 2012):

- Auto-catalysts (3% per year): Broadening scope of emissions legislation to include new pollutants, heavy trucks and non-road vehicles supported by car production growth of 4% will more than offset continued thrifting and substitution to palladium. Growing hybrid market share will have minor positive impact on loadings, with all other alternative auto technologies together expected to secure less than 10% market share by 2020.
- Jewellery (5% per year from 2010 - 2020): Demand driven by continued market penetration in China.
- Industrial (4% per year: Stable demand from chemical and petroleum complimented by new applications including gas-to-liquids, bio-fuels production and waste treatment, etc.
- Fuel Cells (38% per year off a low base): Growing momentum specifically in residential power generation and portable application (e.g. mobile phones, laptops, etc.) will see fuel cells starting to materially contribute to demand after 2015.

Thus, from an economic perspective, being able to extract resources from the Waterval TSFs provides a sustainable business opportunity for (AAP) to meet future product needs.

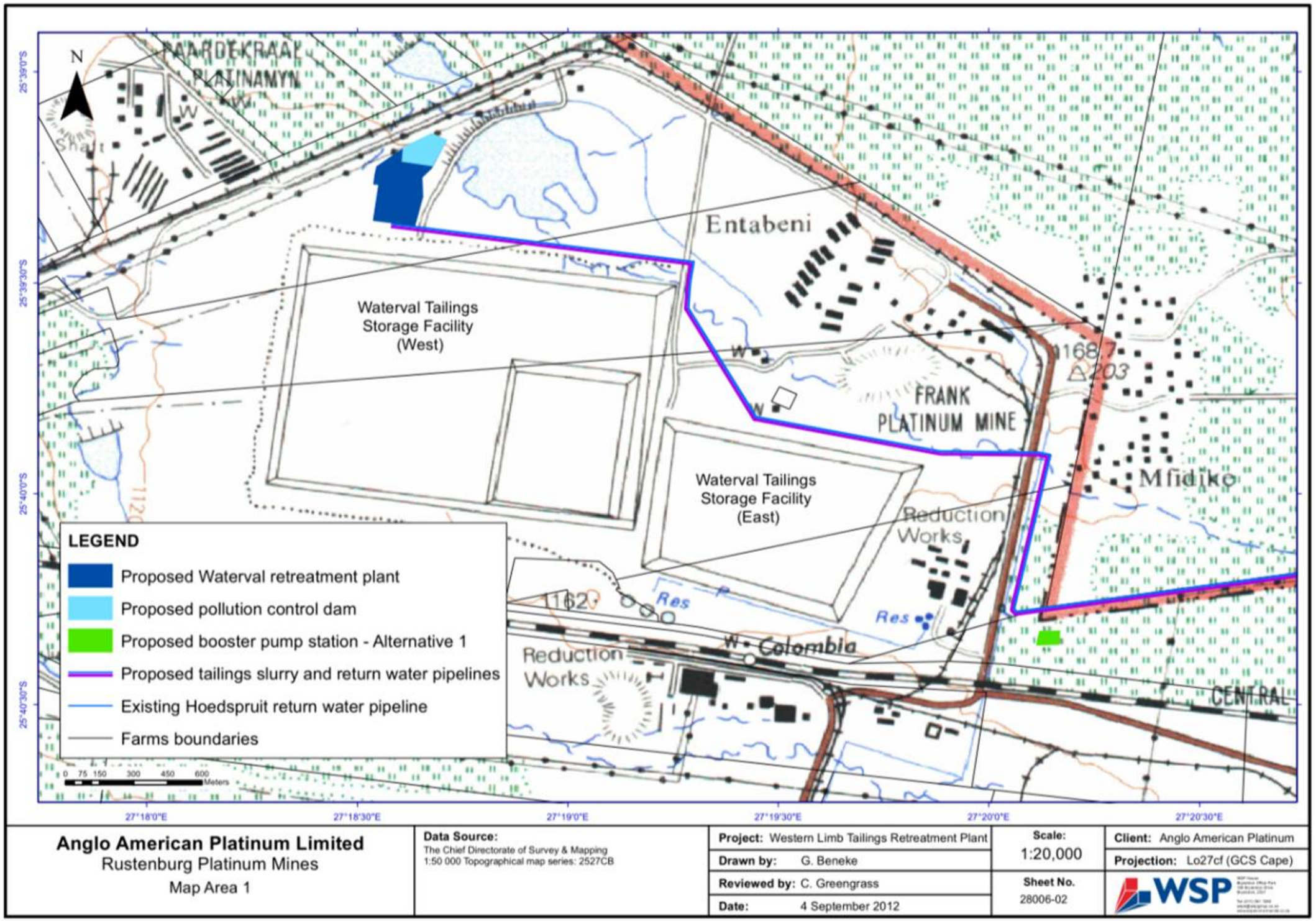


Figure 3: Proposed Project Footprint – Map Area 1

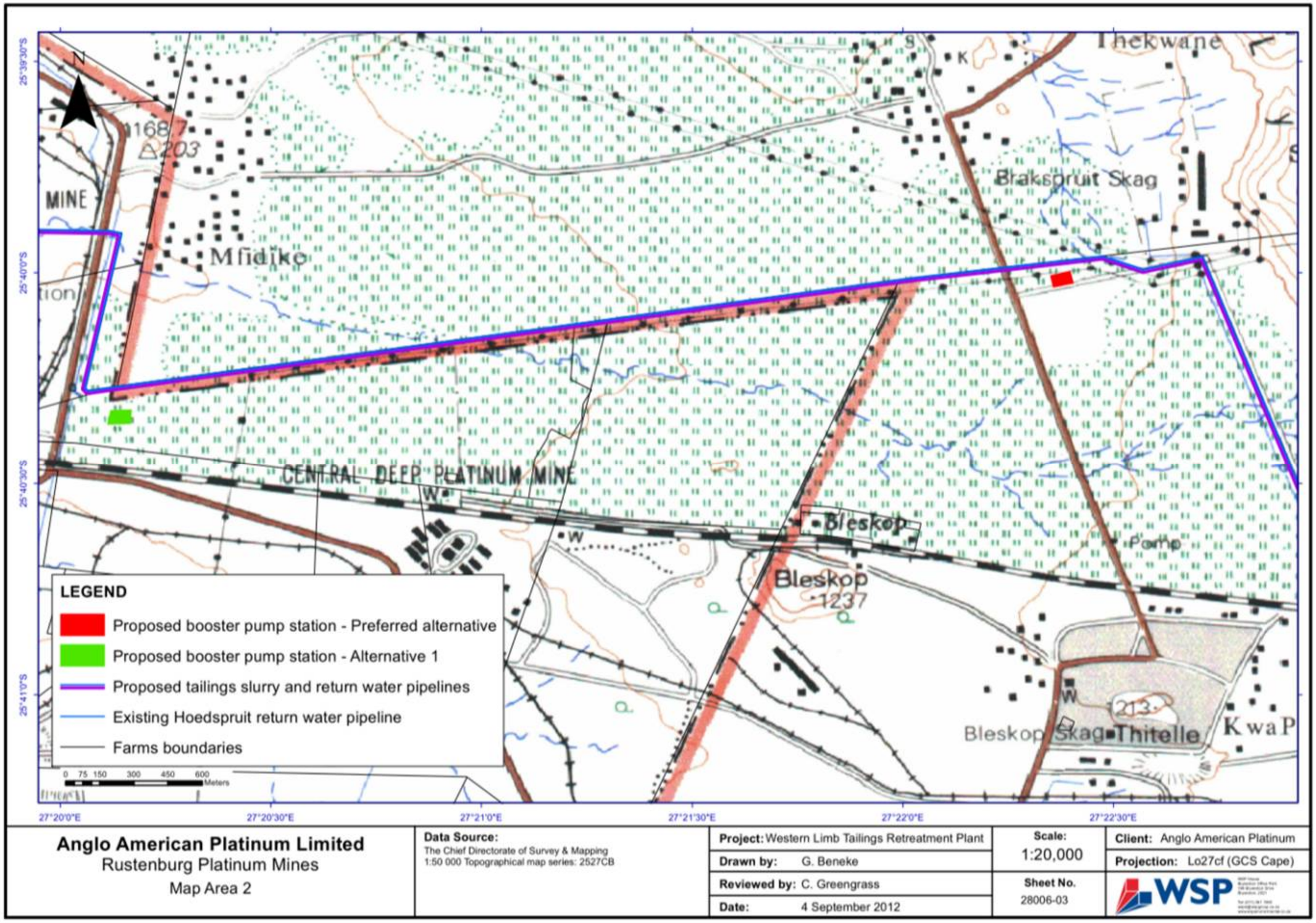


Figure 4: Proposed Project Footprint – Map Area 2

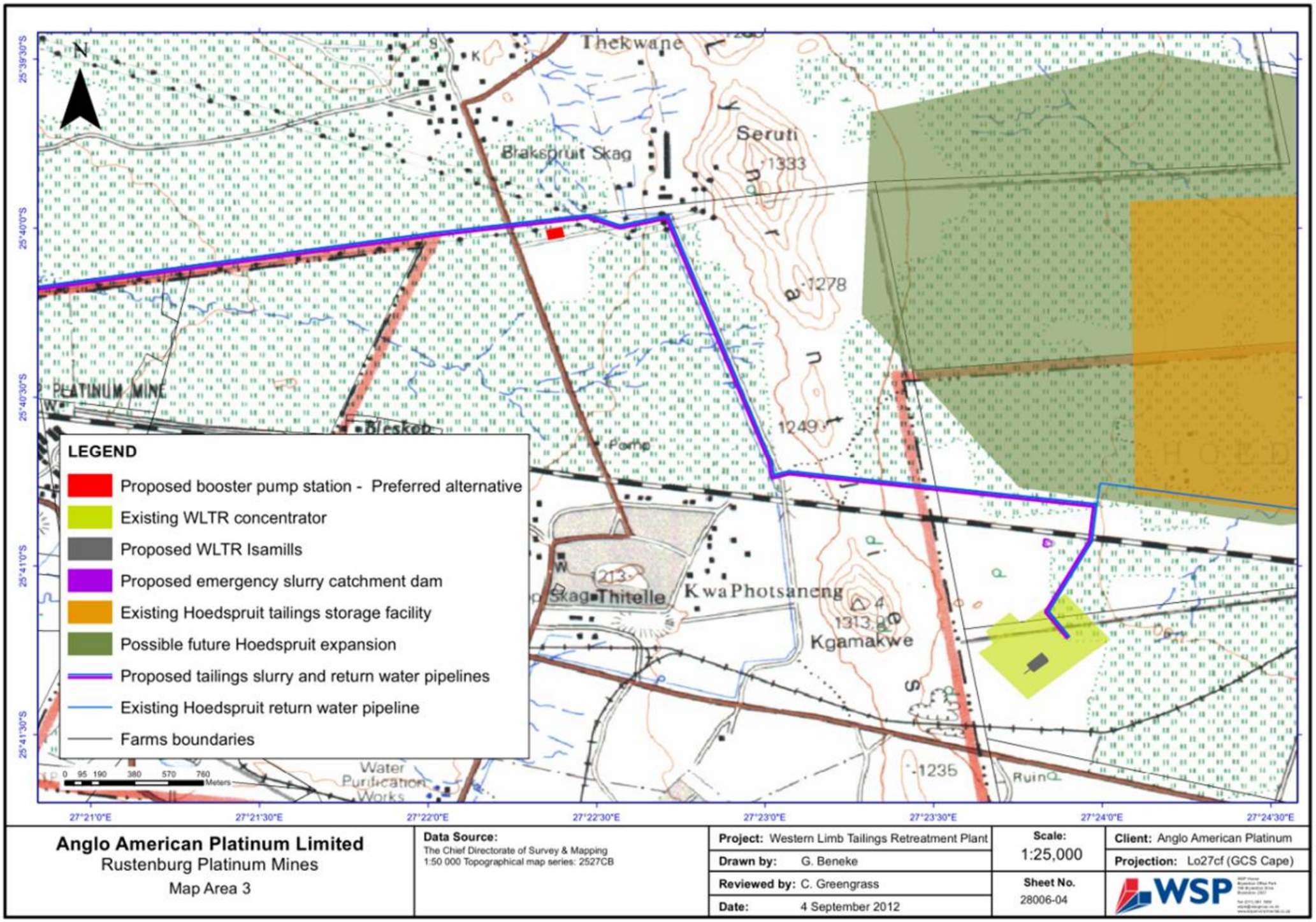


Figure 5: Proposed Project Footprint – Map Area 3

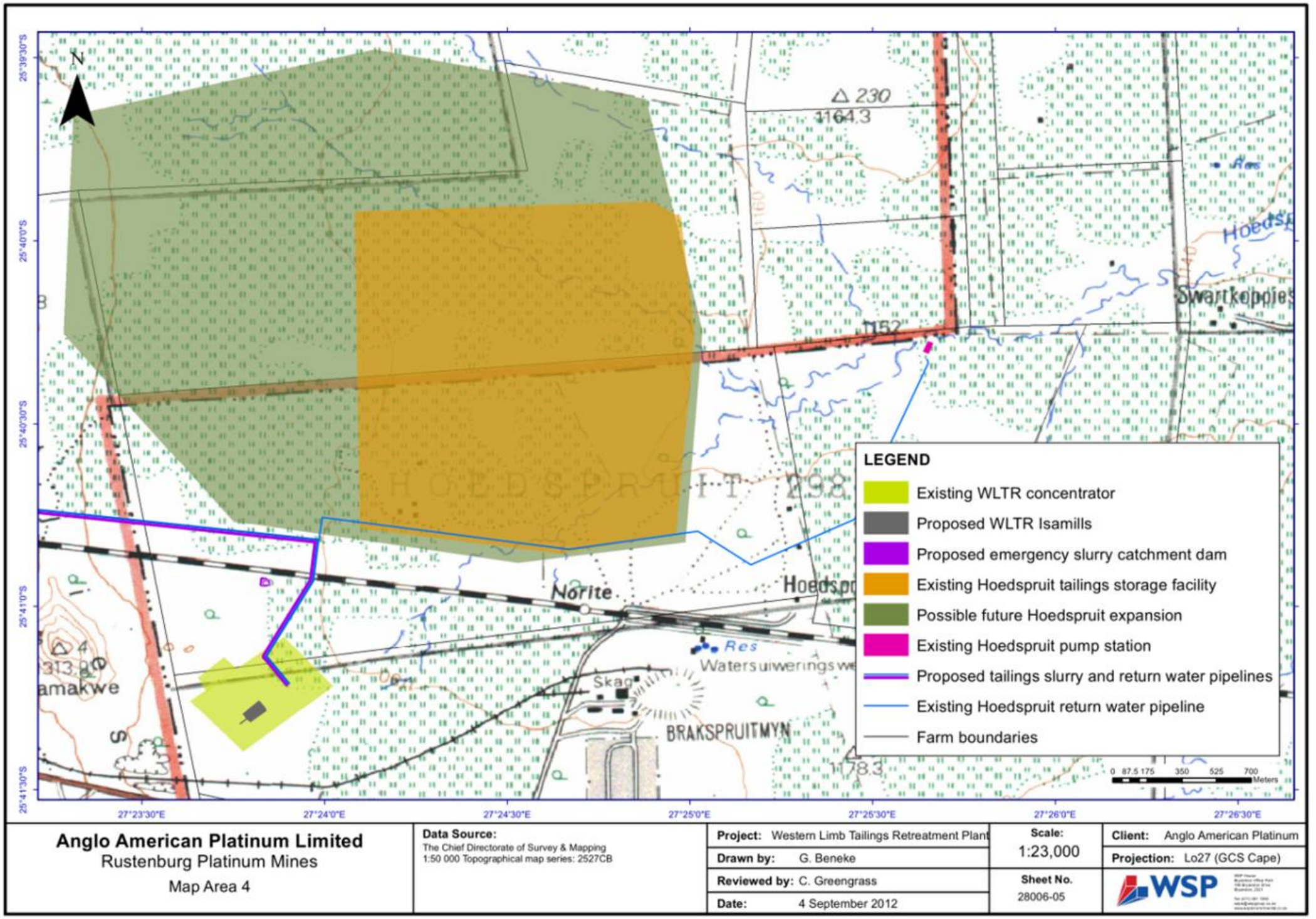


Figure 6: Proposed Project Footprint – Map Area 4

1.4 Details of the Applicant

1.4.1 Details of Applicant

Anglo American Platinum Limited is the world's leading primary producer of PGMs and accounts for approximately 40% of the world's newly mined platinum. The Company is listed on the JSE Limited and has its headquarters in Johannesburg, South Africa (EMPR, 2002).

Relevant contact details of the applicant are included in the table below.

Table 4: Project Applicant Details

Detail	Rustenburg Platinum Mines Limited
DMR Reference Number	RNW(KL) 6/2/2/3164
Contact Person	Mr Danie Vermaak
Postal Address:	PO Box 8208, Rustenburg, 0300
Telephone:	014 598 3422
Fax:	014 598 1153
E-mail:	danie.vermaak@angloamerican.com
Mine Owner	Anglo American Platinum Limited
Project Manager	Mr Pierre Malan

1.4.2 Responsible Person

The responsible person for the proposed project from RPM is detailed below:

Table 5: Responsible Person

Detail	Rustenburg Platinum Mines Limited
Responsible Person	Mr Pierre Malan
Postal Address:	PO Box 62179, Marshalltown, 2107
Telephone:	011 373 6760
Fax:	011 373 5587
E-mail:	pierre.malan@angloamerican.com

1.5 Environmental Assessment Practitioner Details

WSP is a leading South African environmental consultancy with a broad range of expertise and over 20 years' experience in the regional environmental market. Whilst we are owned by WSP Environmental Ltd, a global Environment and Energy multi-consultancy listed on the London Stock Exchange (WSP Group PLC), we are also committed to transformation in our operational region having achieved Level 3 BBBEE compliance in South Africa. As part of a global business we provide the regional marketplace with a dynamic blend of local and global expertise.

By fully understanding our clients business, associated operations and requirements, and combining this knowledge with our strong legal and technical competence we are able to provide our clients with sound strategic advice and improved environmental performance.

We pride ourselves on our reputation for delivery and technical excellence and provide a broad range of environmental and energy related services across a range of economic arenas including the industrial, mining, financial, tourism and public sectors. Refer to **Appendix 2** for a copy of WSPs Capability Statement.

Table 6 details the contact details of the EAP.

Table 6: Responsible Person

Environmental Assessment Practitioner	WSP Environment and Energy
Contact person:	Catherine Greengrass
Physical address:	199 Bryanston Drive, Bryanston, 2021
Postal address:	PO Box 5384, Rivonia, 2128
Telephone:	011 361 1395
Fax:	086 240 0693
E-mail:	Catherine.Greengrass@wspgroup.co.za

1.6 Terms of Reference

1.6.1 Requirement of this Document

Prior to the commencement of any activity associated with the proposed re-processing project, environmental authorisation will need to be obtained in accordance with the NEMA and MPRDA. Authorisation will need to be granted by the North West DMR in accordance with the MPRDA, which requires RPM to undergo an environmental management programme (EMPR) amendment process. It must be noted that RPM received authorisation from the DMR in 2002 for an EMPR amendment for the WLTR and the re-processing of Klipfontein TSF and Waterval TSFs (DMR Reference RNW(KL) 6/2/2/3316). The re-processing of Klipfontein TSF was implemented in terms of 2002 EMPR, however the Waterval Phase was not implemented. Since then the design for the Waterval Phase underwent changes that included changes to the proposed slurry pipeline route and the inclusion of infrastructure such as the pre-treatment plant, booster station and other items.

Furthermore, the North West Department of Economic Development, Environment, Conservation and Tourism (NWDEDECT) will need to approve the project in accordance with the NEMA.

A full scoping and environmental impact assessment (EIA) process will need to be undertaken in order to assess the risks associated with the proposed Waterval re-processing project. The scoping phase of this project involves the investigation of the baseline environment, scope of the project and potential impacts that may occur as a result of the project activities.

The proposed slurry pipeline route will cross the Klipgatspruit River and run along its floodlines . The proposed pipeline will however follow the path of an existing pipeline (a compressed air pipeline between the WLTR Plant and the Klipgat Return Water Dam). An Integrated Water Use Licence (IWUL) in terms of the National Water Act (36 of 1998) was attained by RPM for all its existing water uses in March 2012, which included river crossings along the existing compressed air pipeline. Consultation with the Department of Water Affairs (DWA) will be conducted to determine if the existing IWUL can accommodate the inclusion of the proposed new slurry pipeline and return water pipeline at existing licenced crossings.

1.6.2 Approach and Methodology

As authorisation is required in accordance with the NEMA and the MPRDA, WSP has compiled a scoping report (this report) in accordance with the NEMA EIA Regulations (Government Notice Regulation (GNR) 543 of 2010) and the MPRDA Regulations (GNR 527 of 2004).

The scoping report has been compiled in a diligent and independent manner, and includes the following:

- Detailed project description and motivation (**Section 2**);
- Assessment of project alternatives, including location, land use, technology and 'no-go' alternatives (**Section 3**);
- Description of the baseline biophysical and socio-economic conditions of the project area (**Section 4**);
- Description of the relevant government legislation applicable to the proposed project (**Section 5**);
- Methodology applied during the scoping phase (**Section 6**);
- Detailed stakeholder engagement process undertaken for the project (**Section 6**);
- Potential environmental and socio-economic impacts, including cumulative impacts (**Section 7**);
- Plan of study for the EIA phase of the project, and way forward (**Section 8**); and
- Conclusion (**Section 9**).

Once the EMPR amendment [inclusive of the Environmental Impact Report (EIR) and EMPR) has been authorised, it can be used as a decision-making tool to manage impacts associated with the proposed project.

2 Project Description and Motivation

2.1 Detailed Project Description

2.1.1 Overview

The West and East dams of the Waterval TSF (**Figure 7**) have been identified for reclamation using hydraulic reclamation methods. The process involves the hydraulic sluicing of the previously deposited tailings material that will be pre-treated and transported via a ±12 km overland pipeline to the existing WLTR Plant, located to the east of the Waterval TSF. Information on proposed project components is provided below and further detail will be provided during the EIA Phase as certain project components are still being developed and designed. Detail on the criteria that will be considered during the feasibility and EIA phases of the project has however been provided in **Appendix 3** for further information.

Figure 7: Waterval East TSF (left) and Waterval West TSF (right)

2.1.2 Waterval Tailings Storage Facilities

It is proposed that the tailings material at the face of the TSF's will be hydraulically reclaimed by two 150 mm skid mounted high pressure water guns (monitor guns) that will remove material from top – down. The high pressure water will be generated by running low pressure water, obtained from onsite water tanks supplied by the existing Klipgat Return Water Dam, through a series of pumps that will increase pressure to 40 bar water pressure. It is anticipated that approximately 16,000 tonnes slurry material be reclaimed per day; each monitor gun sluicing 8,000 ton / day.

It has been proposed that the 'herring bone' technique be implemented in reclaiming the TSFs. For this technique, the West TSF reclamation face will be subdivided into three benches – upper bench (14 m), middle bench (12 m) and lower bench (12 m). The East TSF face will be divided into two benches – upper bench (12 m) and lower bench (12 m). The eroded slurry material will be collected in a sump.

The reclaimed material will undergo a pre-treatment filtration / screening process prior to entering the pre-treatment plant. This involves the conveying of slurry material through a launder (washing) system, assisted by 110 kilowatt (kW) pumps, to a collection sump. A launder system will extend from the southern portion of each of the TSFs to the collection sump. The launder will be in excess of 1,000 m in length and approximately 10 m in height and width. The collection sump will act as a safety measure during high rainfall events. Prior to entering the sump, the washed material will undergo screening (vibrating screen) that assists with the removal of debris (e.g. vegetative material).

The collection sump will measure the slurry density every 15 minutes in order to achieve the desired density of the slurry. Density is controlled by configuring the nozzles of the monitor guns and water pressure. The slurry is piped to the proposed pre-treatment plant at the Waterval TSFs and undergoes thickening and water recovery prior to being pumped to outlet pipelines. Overflow from this phase is routed to surge tanks and an emergency PDC will be constructed.

The West and East TSFs have existing stormwater control channels in place. In addition to this, storm water measures will be established in the active reclamation areas to manage stormwater, the details of which will be provided in the EIA Phase. Water contained in the TSFs will be contained, creating 2 m of freeboard during reclamation. The contained water will either percolate into the tailings material or will runoff into the launder system. Water falling outside of the stormwater channels will be directed to solution paddocks and onto the PCD. The PCD is currently designed to have the capacity to contain 25000 m^3 of water (with an 800mm freeboard) and will be constructed in line with GNR.704 Regulations. Final capacity of the PCD will be determined in the EIA process; however, this will not exceed the aforementioned 40,000 m^3. The PCD adjacent to the Waterval pre-treatment plant will also assist with stormwater management onsite during high stormwater events.

A contractor's yard, for use by reclamation staff (ablutions, office space, storage, laydown etc.) is currently proposed adjacent to the Waterval pre-treatment plant (**Figure 9**). The contractor's yard is proposed to consist of the following components, which will be confirmed in the EIA Phase:

- A fenced of yard of approximately 40 m x 60 m;
- Two 6m x 3m office containers;
- Two 6m x 3m storage containers;
- One 3m x 12m ablution container;
- Carports;
- A laydown / storage area of approximately 10m x 10m;
- A concrete slab of about 20m x 20m for high pressure pumps; and
- Three portable toilets on site.

The temporary contractor's yard will be required for a period of approximately 15 months however, the exact timeframe is to be confirmed during the EIA phase.

Figure 8: View of Klipgat Return Water Dam from West TSF. Adjacent to the dam on the right is the proposed site for pre-treatment plant and pollution control dam

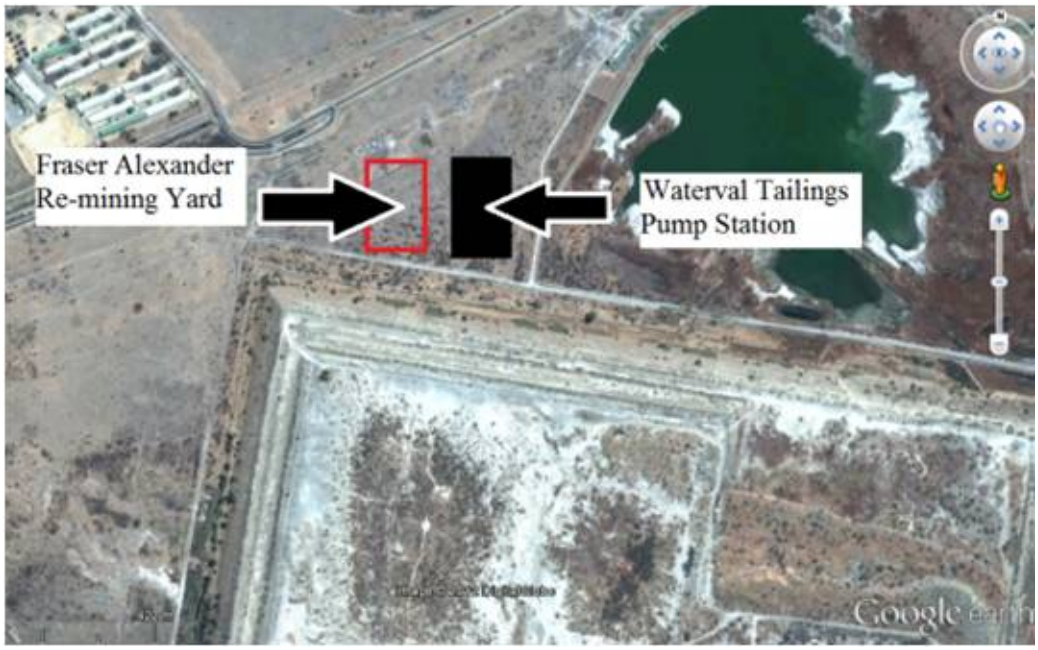


Figure 9: Proposed location of the Fraser Alexander laydown area (reclamation contractor yard)

2.1.3 Pipeline and Booster Station

The pump station at the Waterval pre-treatment plant will pump the slurry material via overland pipelines with a diameter of 400 mm over a total length of ± 12 km to the WLTR. The return water overland pipeline will bring

water back from the Hoedspruit Return Water Dam to the Waterval pre-treatment plant, in a 500 mm diameter pipeline over a total length of ± 15 km.

It has been noted that the proposed slurry and return water pipelines will follow an existing pipeline corridor (compressed air pipeline). Information pertaining to the registration of the corridor as a servitude, that will accommodate the proposed slurry pipeline, will be provided in the EIR.

Four river crossings will be required as the pipeline crosses the Klipgatspruit River in two locations. It is estimated that a maximum throughput capacity of 500 ktpm of slurry material (± 1000 m^3 / hr) will be transferred. **Figure 10** shows an example of overland pipelines similar to those which are proposed.

Figure 10: Example of overland pipeline

A booster station will be constructed that will assist with the transportation of slurry material from the Waterval TSF to the WLTR Plant. It has been proposed that the booster station be constructed south of the Siphumelele Shaft 1, approximately 8 km east of the Waterval pre-treatment plant. The booster station will house a water storage facility (500 m^3), a sump for slurry spillage (± 80 m^3) and booster pumps that will feed into an overland pipeline to the WLTR Plant. A laydown area at the proposed booster station will be required for the storage of material and equipment (**Figure 11**).

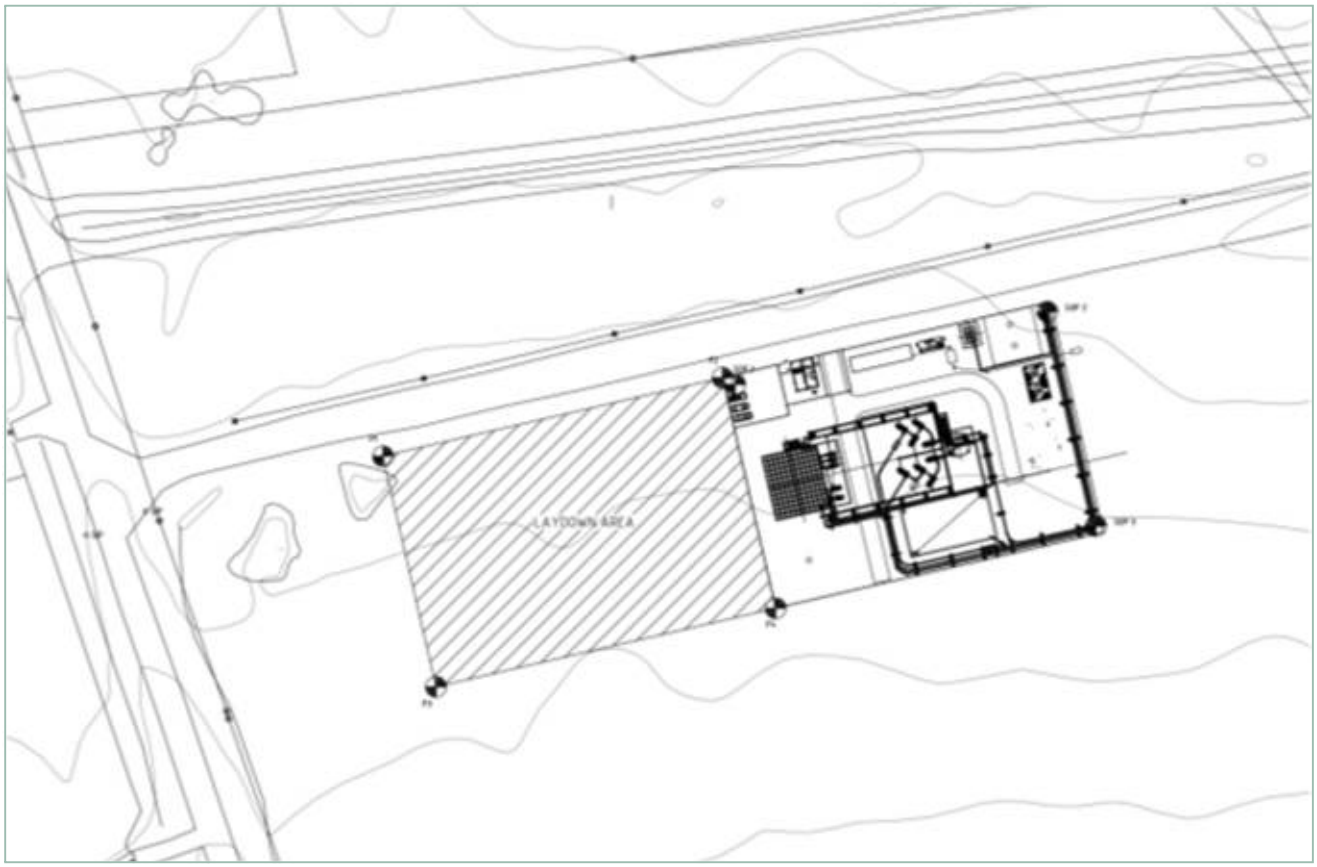


Figure 11: Siphumelele booster station laydown area

2.1.4 WLTR Plant

The pre-treated slurry material will be received by the existing WLTR Plant (**Figure 12**). As the slurry will have been pre-treated, the material will bypass the laundering and screening phases of the WLTR Plant. The slurry will be stored prior to undergoing a regrinding process where the material will be crushed into a finer material. Finer grinding will be achieved through the proposed installation of four new IsaMills™ within Mainstream Inert Grinding (MIG) applications. A laydown area adjacent to the WLTR is proposed for the storage of machinery and equipment (refer to **Figure 14**)

The fine slurry will be transported to a flotation plant where the necessary PGEs will be removed through the existing technology (grinding, flotation and concentrating). Water recovered from this process will be piped back to Klipgat Return Water Dam. Resultant tailings will be piped to Hoedspruit TSF.

Figure 12: Existing Western Limb Tailings Retreatment facility showing flotation cells (middle) and ball mill (right). In the foreground is the proposed site for the four proposed IsaMills™

Figure 13: Example of an IsaMill™

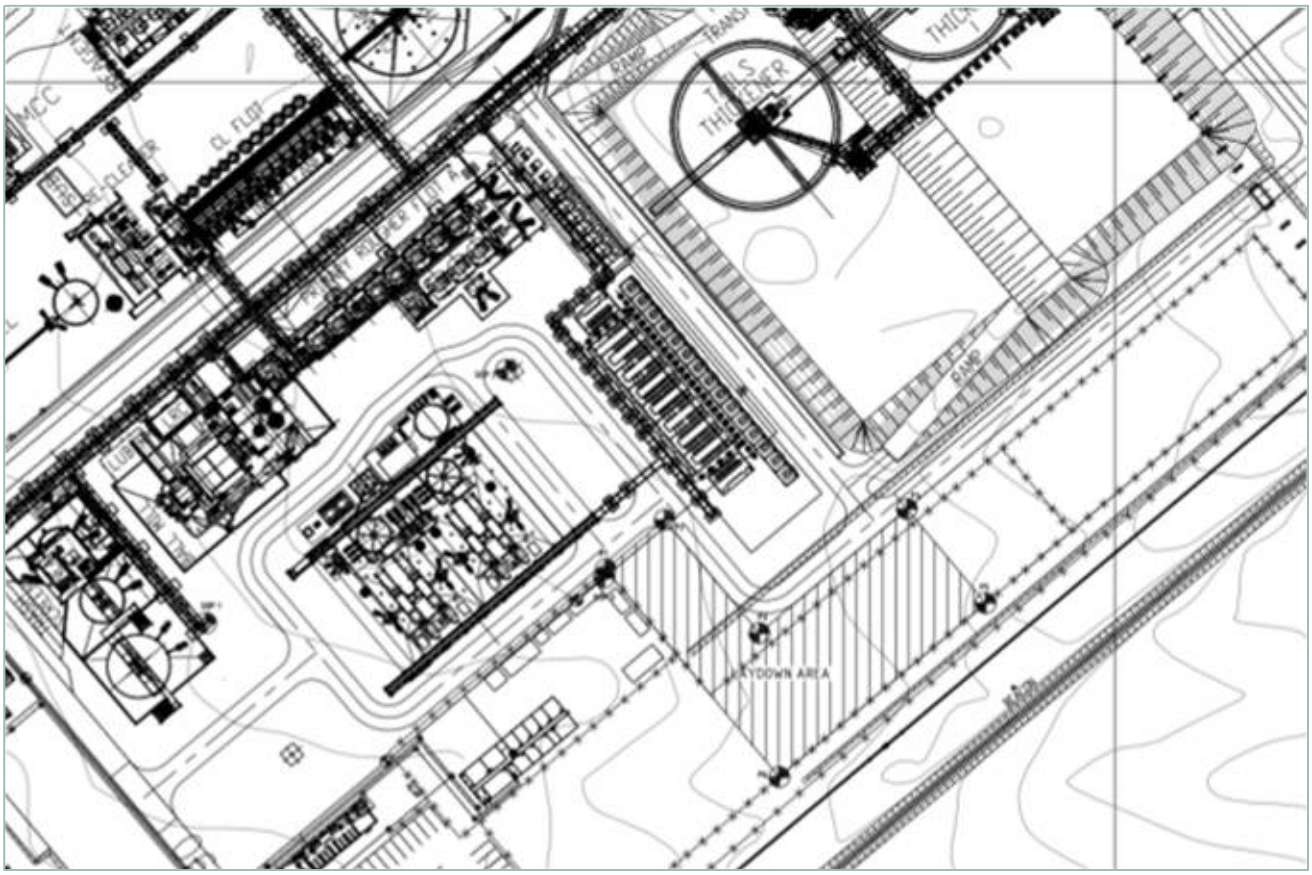


Figure 14: WLTR laydown area

2.1.4.1 Reprocessed Tailings Storage

Resultant tailings material generated from the project will be piped to the Hoedspruit TSF. The Hoedspruit TSF was originally designed to handle tailings produced from the Waterval and Klipfontein concentrators, with the option for RPM to also use this TSF from future tailings storage from other RPM activities. It was designed for a 750 ha surface area and storage to a height of 120 m (1277 metres above seas level (masl)). In the 2002 EMPR amendment, the Hoedspruit TSF is was indicated that Waterval Tailings would increase the Hoedspruit TSF to 45m in height (1202 masl).

The Hoedspruit TSF is comprised of three compartments, namely compartments B, C and D. Of the said compartments only compartment B (254 ha) has been utilised by RPM to date.

For the current EMPR amendment, it is proposed that the final destination of the Waterval tailings after re-treatment at WLTR will be on Hoedspruit compartment B. The elevation of 45m will, however be exceeded in approximately the 9th year of Waterval tailings reprocessing thus it is proposed to increase the height to the Hoedspruit TSF to 68m in height (1225 masl).

It should be noted however that development of adjacent tailings compartments cannot be considered in isolation. Since they will be directly adjacent to each other they may share infrastructure such as starter walls. An investigation is therefore currently underway to determine the safest and most feasible, development scenario for the full authorised footprint of the Hoedspruit TSF into the future, taking into consideration the storage requirements of the current Waterval TSF reprocessing project and potential tailings storage from other RMP operations in the future. The findings of this investigation will be included and assessed in the EIA report. The final height requirements of the Hoedspruit TSF for all compartments will also be indicated and assessed.

Changes to the Hoedspruit pumpstation located at the Hoedspruit RWD are proposed, which will include the installation of new pumps required for the return of water from the Hoedspruit RWD to the pre-treatment facility at Waterval TSFs (**Figure 16**).

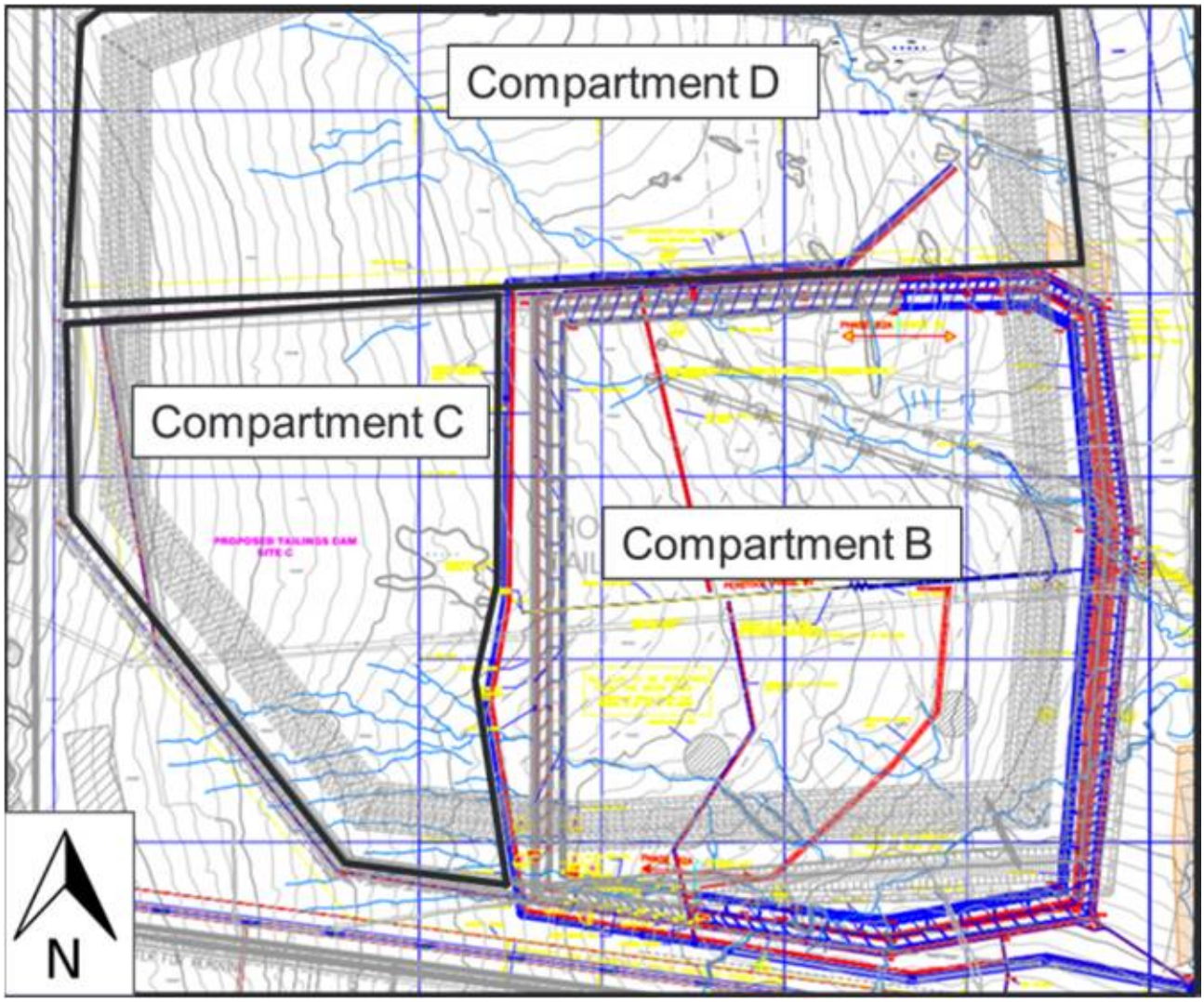


Figure 15: Hoedspruit TSF

Figure 16: Hoedspruit pumpstation laydown area

2.1.5 Associated Infrastructure and Structures

2.1.5.1 Administration Buildings and Ablution Facilities

Administration buildings for management will need to be constructed at the Waterval pre-treatment plant and the booster station. No existing municipal sewage services are located in close proximity to these areas, thus, septic tanks systems (with soak-a-ways) are proposed for ablution facilities at the plant.

2.1.5.2 Access Roads

It has been noted that a gravel road will be planned to access the proposed Waterval pre-treatment plant, which will connect to the existing access road leading to the Klipgat Return Water Dam. The access road will be approximately 13m in width and 430m in length. It has been noted that traffic entering the Waterval TSF and pre-treatment plant area will be ± 12 light vehicles per day. Furthermore, a parking area for administration staff will be included in the design of the pre-treatment plant footprint. Proposed access to the booster station will be via a 5 m wide road of ±70m long. It is estimated that 7-8 light motor vehicles will access the booster station per day.

2.1.5.3 Water Supply

According to TWP (2012), approximately 991 m^3 / h of water will be required by the two monitor guns that will be used for reclamation. Water that will be required for the monitor guns will be sourced from the Hoedspruit

Return Water Dam and stored in open tanks at the Waterval Pre-treatment facility. Water will also be supplemented from recovered water at the Waterval pre-treatment facility.

The existing Klipgat Return Water Dam, located on the northern border of the Waterval TSF, is currently being used to store water from the Waterval TSFs and Paardekraal TSF, as well as stormwater from adjacent areas within the Klipgat catchment. Treated sewage effluent from the neighbouring township Boitekong is also stored in this dam.

There is sufficient capacity for this dam to accommodate water required for the reclamation / re-processing process. It is however proposed to construct a new PCD in order to separate water used in the reclamation / re-processing process to manage the potential water aspects of the reclamation at the source.

Potable water for the Waterval pre-treatment plant will be obtained from the feed line at the Klipgat Pump station. Potable water will be sourced for the booster station from the existing potable water supply within Siphumelele Mine (Shaft 1) facilities. Potable water for the WLTR Plant will be sourced from the existing water reticulation system at the site. Potable water is available in the vicinity of the pre-treatment plant at the Waterval TSFs. The details of sourcing water from the available system(s) will be investigated in the EIA Phase.

2.1.5.4 Power Supply

It has been calculated by TWP (2012) that the hydraulic reclamation operation (including pre-treatment) will require 9 Megavolt Ampere (MVA) of power for operation. Electricity can be acquired from the Klipgat Pump station feeder (Eskom). This will involve the upgrade and extension of the existing 11 kV overhead line from 6th Point Substation to Klipgat Pump station.

Electricity required to operate the booster station will be fed from the Siphumelele Mine consumer substation. The booster station will require an estimated 2 MVA of power and an 11kV overhead line will need to be constructed over a length of ± 1km.

The existing substation at the WLTR Plant will be used to supply the additional ISA Mills^{TM}. The additional operations will consume 13.5 MVA of power. The additional pumps at the existing Hoedspruit TSF pump station will be supplied using an existing overhead line (11 kV) of sufficient capacity.

According to TWP, Eskom has confirmed that the existing municipal grid will have adequate supply to provide the electricity required for the project.

3 Project Alternatives

3.1 Introduction

During the Pre-feasibility Phase of the proposed project, which precedes the current phase (Feasibility Phase), options relating to various aspects of the proposed project were considered and assessed in terms of their feasibility and the most suitable options selected. Alternatives that were considered as part of the Pre-Feasibility Phase included:

- Pipeline route;
- Pipeline installation and crossings (roads, powerlines and a river);
- Water reclamation;
- Reclaimed water storage; and
- Re-processing alternatives.

The above-mentioned alternatives are described in order to provide an understanding of how the most feasible (preferred) alternatives (as described in **Section 3**) were determined prior to initiating the Scoping and EIA process. Additional alternatives identified as part of the EIA Phase will be included in the EIR.

3.2 Pipeline Route Alternatives

The route of the 2002 EMPR approved pipeline (preferred option) (Ref. No. RNW (KL) 6/2/2/3164) between the Waterval TSFs and the WLTR was reconsidered for the following reasons:

- The 2002 EMPR approved pipeline (**Figure 17**) did not follow an existing pipeline corridor / servitude,
- The original proposed route has since been settled upon by the local community and is no longer available unless relocations were to be conducted; and
- The slurry pipeline requires a booster station and access to electricity will be required.

The new proposed route (**Figure 1**) was therefore selected as it that runs alongside an existing pipeline route and there are currently no people living on this route so relocation of people will not be required. Additionally, there is an available power source along the route for the installation of the proposed booster pump station.

Figure 17: Pipeline route approved in 2002 EMPR amendment

3.3 Pipeline Installation and Crossing Alternatives

It is proposed that the pipeline will be alongside the existing return water pipeline, and will be installed aboveground, instead of underground, for the following reasons:

- Costs associated with installing an underground pipeline are higher than the cost of an overland pipeline;
- The existing return water pipeline is overland and thus the new proposed pipeline will fit in to the existing nature of the infrastructure in the area;
- Maintenance of an overland pipeline is easier, cheaper and can also be done quicker, thereby ensuring quicker mitigation should an incident occur; and
- Settlement by people along the pipeline can be avoided.

3.4 Water Reclamation Alternatives

Currently water reclamation for the tailings reclamation and re-processing of the Klipfontein TSF is occurring at the WLTR and reclaimed water is piped back to reclamation operations at Klipfontein. For the reclamation of the Waterval TSF it is proposed that excess water is reclaimed at the pre-treatment plant, which is to be located adjacent to the Waterval TSF (**Figure 3**). Reclamation at the pre-treatment plant will reduce infrastructural costs and energy requirements that would be incurred should reclamation occur at the WLTR and need to be piped back to the Waterval Tailings reclamation operations.

3.5 Re-processing Alternatives

Four options for re-processing were evaluated in the Engineering Pre-Feasibility Study (TWP, 2012). These are as follows:

1. No-go / do nothing, i.e. deplete Klipfontein and close WLTR down in 2015;
2. Re-treated Waterval reclaimed tailings at WLTR at 450 kt / m from 2014;
3. Re-treated Waterval reclaimed tailings at WLTR at 450 kt / m from 2014 and add 4 IsaMills^{TM} in 2015 / 16; and

4. Re-treated Waterval reclaimed tailings at WLTR at 500 kt / m from 2014 and add 4 IsaMills™ at WLTR in 2015 / 16.

Metallurgical pilot-plant test work was conducted (TWP, 2012) to determine the increase in production that can be anticipated through the use of IsaMills™ within Mainstream Inert Grinding (MIG) applications for regrinding of the reclaimed tailings. Tests showed that an increase of 15 % in production can be anticipated. Option 4 has therefore been proposed as the most feasible option and beneficial.

3.6 Waterval TSF Land Use Alternatives

Once the Waterval TSF's have been reprocessed the land at which they are located will be rehabilitated. Land use alternatives for this land will be investigated in the EIA Phase.

3.7 No-Go Option

Option 1 above indicates the No-Go Option of carrying out current activities until the Klipfontein TSF will be depleted by 2015 and then closing down the WLTR. The proposed reclamation and re-processing of the Waterval TSF will result in approximately 1000 new, temporary job opportunities during construction, 50 % of which will be sourced locally. It also presents an opportunity to efficiently and sustainably utilise the mineral resources in the tailing, which will otherwise remain as a TSF with associated liabilities and rehabilitation requirements.

4 Description of the Existing Environment

4.1 Geology

4.1.1 Rustenburg

The geology of the Rustenburg area is relatively stable and dominated by formations of the Pretoria Group of the Transvaal sequence. This group consists of different geology types such as quartzite, norite, hybrid rocks, diabase, epidiorite, slate, shale, hornfels and gabbro. Slopes with more stable quartzite geology dominate the whole area and the lower lying areas have a more active geological substrate containing norite and gabbro rocks. Gabbro is more prevalent in flatter areas associated with river courses. The Pilanesberg Complex and the Witwatersrand Supergroup are found in the east and south respectively. On the western side (Bafokeng area), runs the Transvaal Sequence and Pretoria Group. This area is also known for the world's largest layered Bushveld Igneous Complex that is rich in platinum and chrome minerals. The Bushveld Igneous Complex is also known as the Merensky Reef that was formed billions of years ago when molten rock was injected into a series of chambers for about 2 km below the surface (Draft Rustenburg IDP, 2012-2017). **Figure 18** below represents the position of Rustenburg in relation to the Bushveld complex.

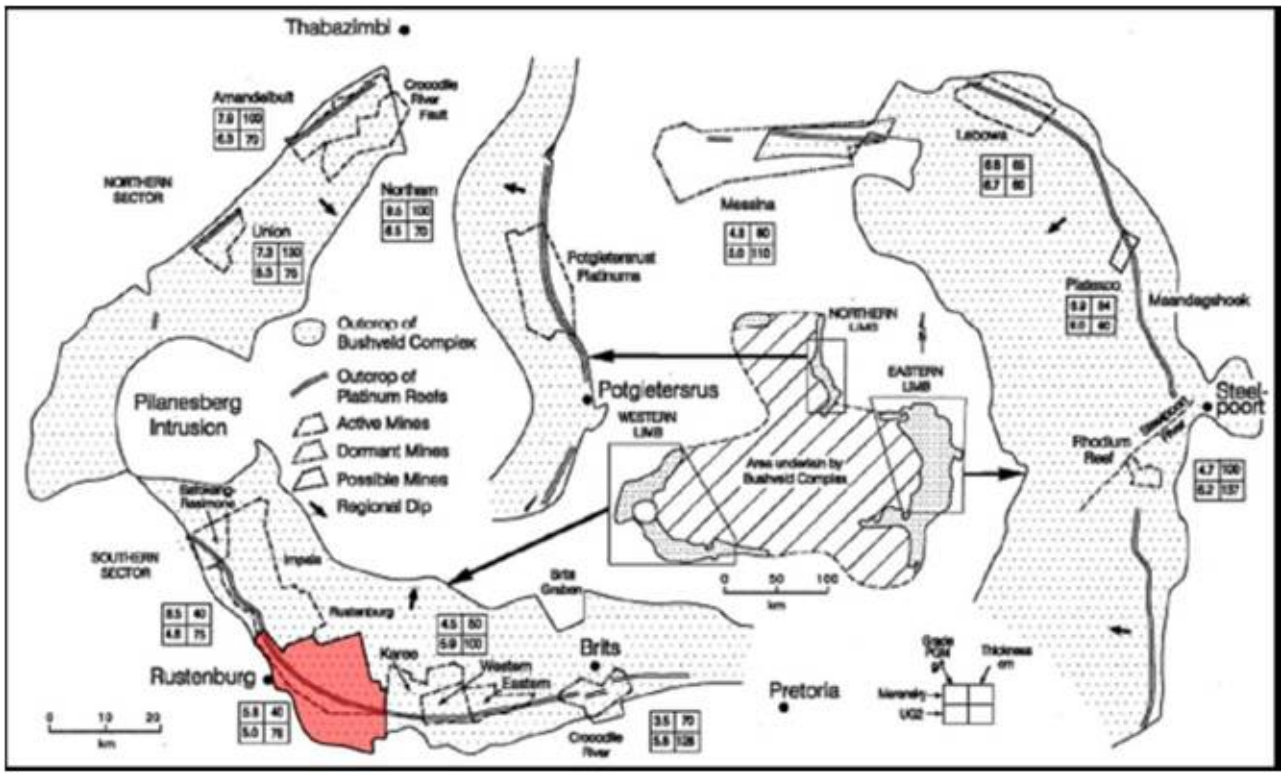


Figure 18: Rustenburg Section of the Bushveld Complex

4.1.2 RPM Lease Area

The mining / reclamation / re-processing operations of the RPM occur in the Bushveld Layered Igneous Complex. The RPM mining areas are located on the South-western edge of the Bushveld Complex (as indicated on **Figure 18**), thus in the Southern part of the so-called Western Limb. **Figure 19** represents the Merensky Reef workings and the UG2 Reef workings which form part of the Bushveld Layered Igneous Complex. The Merensky and UG2 reefs contain valuable mineral deposits which are mined by the RPM. The geology of the area consists mainly of norite rock types that vary from light-coloured leuco-norite with a low percentage of pyroxene minerals to dark coloured norite with an abundance of pyroxene. Norite is a medium to

coarse grained basic igneous rock. The dark coloured rocks are sometimes also graded as pyroxenite due to the total dominance of mafic (dark-coloured) pyroxene minerals (K6 Shaft project EIA, 2009).

A fault trending east north east (ENE), as identified from underground mine plans, crosses the northern part of the WLTR site. A diabase dyke strikes in a north-northwest (NNW) direction and passes through the western side of the WLTR site below the parking area, near to the plant entrance. The width of this dyke is narrow, ranging between 7 m and 9 m. Near the centre of the dyke, it comprises large boulders from spheroidal weathering, up to 1 m in size with a relatively small proportion of residual silt matrix material and black clay cover of less than 1 m (markedly thinner than over the country rock).

During the 2002 geotechnical investigation, various test pits were excavated in order to determine the soil profile as well as the localised geological structures at the WLTR plant, along the proposed pipeline, and at the site proposed for the construction of the Waterval pre-treatment Plant.

A geo-technical investigation is currently underway at the site proposed for the PCD as well as any areas which have yet to be investigated in terms of underlying geology. The said non-detailed sites have not been investigated to date as the layout of certain components of the proposed project changed since the completion of the pre-feasibility study. The detailed findings of the various test pit investigations are detailed in the 2002 EMPR report [ref no. RNW(KL) 6/2/2/3164]. The outstanding geo-technical report will be incorporated into the EIR.

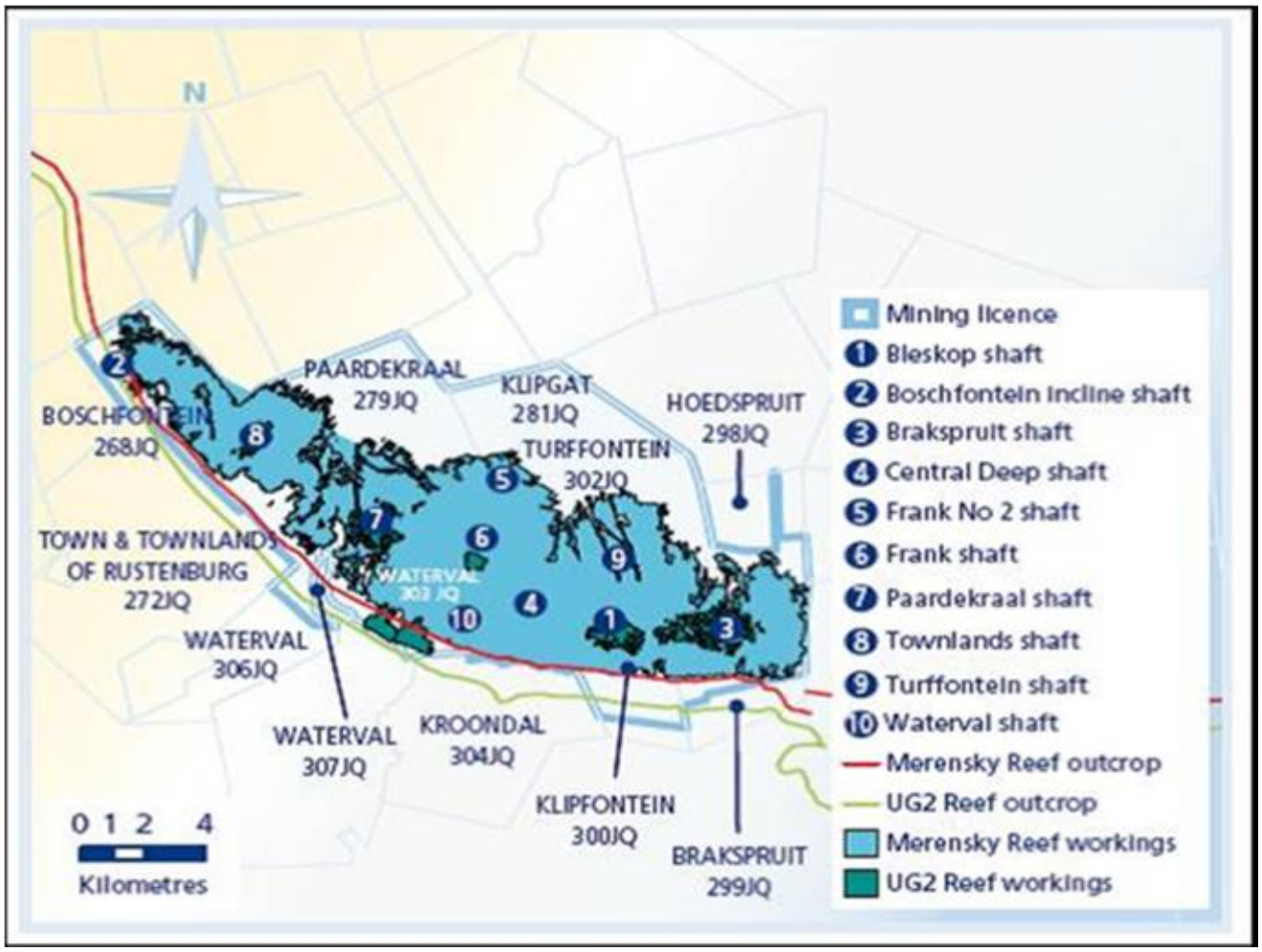


Figure 19: Merensky and UG2 Reef Outcrops (Anglo Annual Report, 2006)

4.2 Topography

4.2.1 North West Province

The North West Province is purported to have the most uniform terrain of all the provinces, with an altitude ranging from 920-1782 masl. The central and western regions are characterised by flat or gently undulating plains. The eastern region (east and north-east of Zeerust) is of a more variable topography, giving rise to the Magaliesberg mountain range of the Transvaal Sequences Magaliesberg formation. Another prominent feature in the east is the Pilanesberg which consists of a formation of concentric hills or ring- dykes, remnants of an ancient volcano (State of the Environment Report- North West, 2002).

4.2.2 Rustenburg

The RLM consists of relative escarpment, hills and lowlands, lowlands with parallel hills, plains, slightly undulating plains and undulating hills. A large series of ridges and koppies are situated mostly in the central parts, with various mountain ranges and ridges making up the most prominent Bafokeng area topography. The area is mostly dominated by a flat undulating slope ranging from 0 to 9 %. However, the central part of the Rustenburg area is characterised by elevated slope ranging from 9 to 15 % covering the Magaliesberg Protected Environment and the Kgaswane Mountain Reserve. Some patches of the medium elevated slope ranging between 15 to 25 % are also found in the central part.

4.2.3 RPM

The general topography of the pipeline route dips gently east- and westwards away from the prominent line of north-south oriented hills. The WLTR Plant is situated on a gentle (1:50) easterly slope. The natural drainage of the site is towards the ENE. The topography of the proposed project area (from the Waterval TSF to the WLTR, along the proposed pipeline route) is illustrated in **Figure 20**.

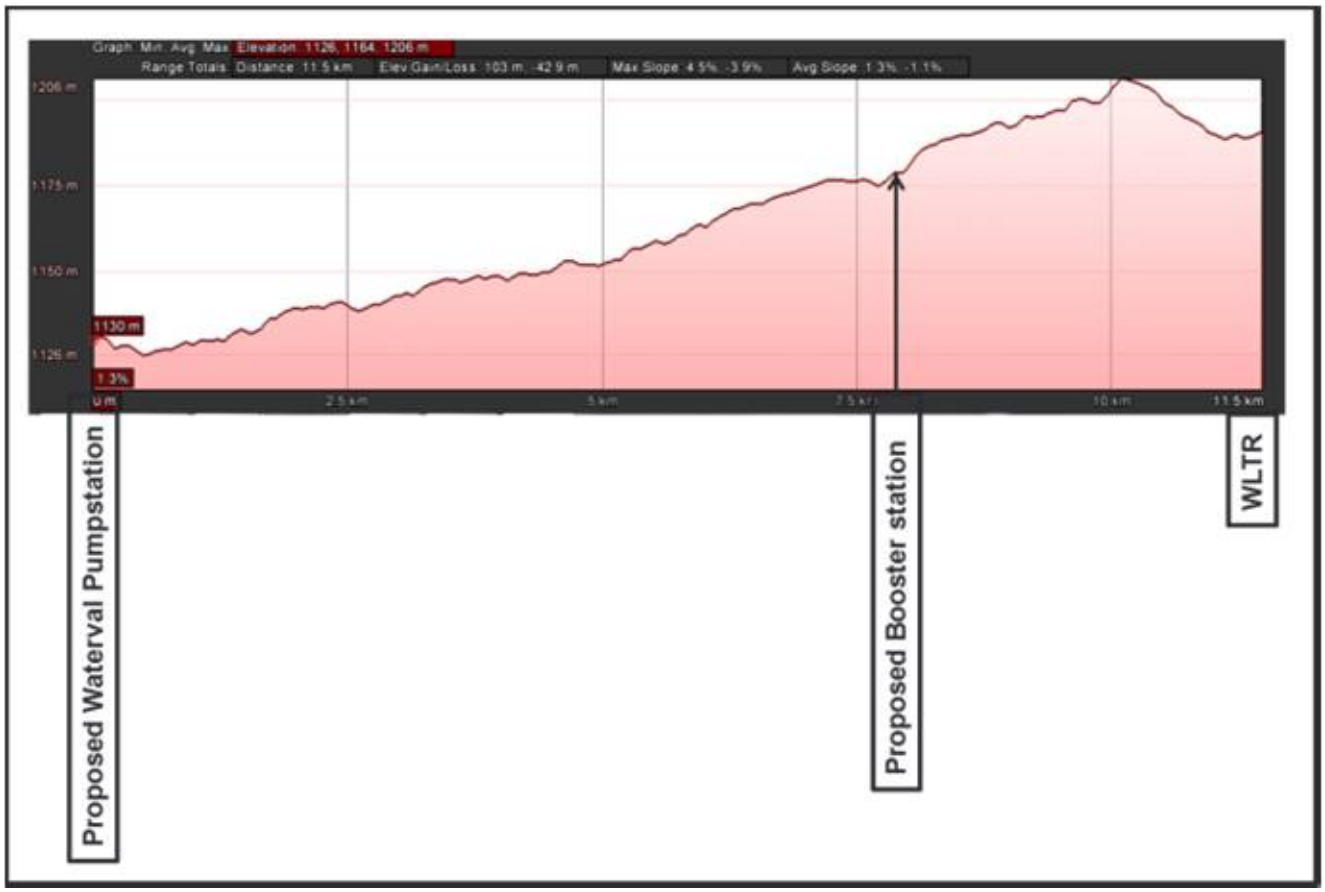


Figure 20: The Elevation profile of the pipeline route (Google Earth, 2012)

4.3 Soils

In the Rustenburg area, in proximity to the sites assessed, the regional soil environment is typified by shallow soils on rocky ridges and gentle to flat mid slopes where Arcadia, Mispah and Hutton soils are found. At the WLTR Plant and along the entire pipeline route the only soil type present is Arcadia, with an average soil depth of 900 mm. The Arcadia soil form is characterised by a deep vertic A horizon over unspecific material. Arcadias are typically high clay soils that have good agricultural potential (EMPR, 2002). Refer to the baseline soil and land capability assessment contained within the 2002 EMPR [ref no. RNW(KL) 6/2/2/3164] for a comprehensive list of soil profiles from various points of the proposed project. **Figure 21** represents the extensive number of sampling points tested during the soil and land capability assessment in 2002 which are detailed in the 2002 EMPR (ref no. RNW(KL) 6/2/2/3164].

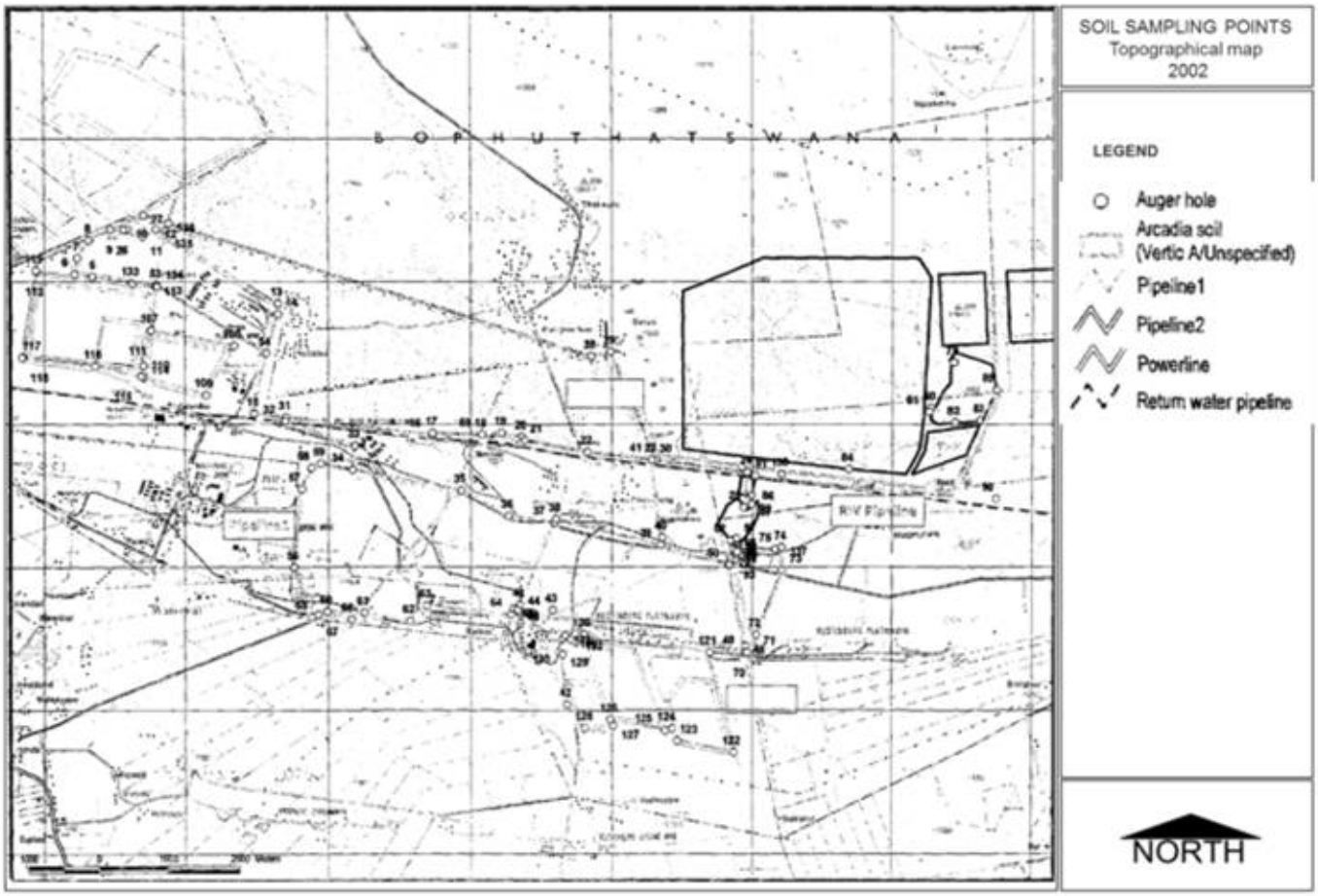


Figure 21: Soil Sampling Points (EMPR, 2002)

4.3.1 Proposed Waterval Pre-treatment Plant

A detailed soil profile of the site proposed for the proposed Waterval pre-treatment plant and the proposed pre-treatment plant is provided in the 2002 EMPR (ref no. RNW (KL) 6/2/2/3164) which details the soil profile including the bedrock type. In summary, the area consists of made ground overlying silty clay, with no refusal at the maximum tractor loader backhoes (TLB) excavator reach. The uppermost layer of fill (1.3 m) of the test pit (2002) consists of loose sand and boulders, underlain by 0.2 m of fine tailings sand. Soft silty clay underlies the made ground.

4.3.2 Proposed Pipeline Route

A generalised soil profile consists of brackish brown, stiff silty clay (reworked residual norite, commonly called black turf). This layer commonly exhibits expansive properties. This overlies a layer of residual norite sand. The sand is off white and dense but highly friable. This layer is locally absent. Underlying this is highly weathered

very soft norite which grades into soft rock norite. In a few of the test pits (particularly close to rock outcrops) the black turf was found to directly overlie hard rock norite (EMPR, 2002 (ref no. RNW(KL) 6/2/2/3164).

4.3.3 WLTR Plant

The black clay of the area is known to be highly expansive and this is confirmed by the foundation indicator test results and the highly fissured and slickensided structure of the soil. The thickness of the black clay varies from 1.0 m to 1.5 m with an average thickness of 1.3 m. A transitional layer of clayey sand with an average thickness of 0.3 m separates the clay from the underlying weathered norite rock. The TLB excavator refused on very soft rock highly weathered norite at an average depth of 1.5 m.

4.4 Land Use and Land Capability

4.4.1 Rustenburg Regional Agricultural Potential

The economic drive has changed in Rustenburg from being agriculturally dominated to being mining dominated. The wealth and development of Rustenburg was dependent on the agricultural sector, of which citrus farming was a large component however, increased interest on the platinum market has shifted economic reliance onto the mining industry.

Most of the Municipal area is occupied by soils that are classed as low to moderate potential agricultural soils, limiting the range of crops that can be grown. These soils consist of dominantly dark, swelling clay soils, which although inherently fertile, are difficult to cultivate with their very narrow range of available moisture. The soils of the area follow the concept of the catena where they are shallow and rocky in the mountainous areas with a lower fertility than the lower lying and clay rich soils at the base. Further down slope, and typically in association with rivers, dams and floodplains are the vertic, melanic and un-differentiated red structured soils. Agricultural areas are therefore located on the fertile soils associated with water availability.

Agricultural land however, is being threatened by the shift in economy from reliance on agriculture to mining. Small-scale agriculture is the most active economic agriculture in the area and this normally involves high produce irrigation farming. This activity is found in the local rural population where municipal services are limited with poor access to water supply. As a result, agricultural activities have become costly and difficult to maintain since it is individuals that must ensure that such activities are sustainable. This pressure is part of the cause to loss of agricultural land as people opt to sell their land for alternative uses such as development and mining (Rustenburg Draft IDP, 2012-2017).

4.4.2 Land Use associated with the RPM project

The Waterval TSF is currently being utilised for the storage of mineral residue however the Waterval TSF once reclaimed will be rehabilitated. Once the site is rehabilitated the land can be utilised by the mine for other land use activities. The proposed land use post re-processing and rehabilitation has not yet been determined.

The proposed pre-treatment plant will include the development of undeveloped land to the north of the West TSF thus resulting in a change in land use. The land however, will undergo remediation and rehabilitation once the life of the mine is reached, as part of the mine rehabilitation plan.

The proposed slurry pipeline will be routed along an existing pipeline corridor and along a portion of a road reserve thus the land use of the proposed pipeline route will not be altered from its current land use allocation. The environment along the road reserve is considered disturbed and it is anticipated that the pipeline along the road will not increase the environmental degradation to a large degree. The proposed booster station, adjacent to the Sephumelele shaft will result in a land use will change from natural land to developed land.

The proposed addition of 4 IsaMills^{TM} at the existing WLTR Plant will not involve the development of any land. The IsaMills^{TM} will be located within the WLTR Plant adjacent to other associated processing infrastructure. The IsaMills^{TM} will not impact upon the land use and land capability of the area.

.

4.5 Flora

The proposed project falls within the Savanna Biome, which is the largest biome in Southern Africa (46 % by area). Conservation of savannah is good in principle, mainly due to the presence of the Kruger and Kalahari Gemsbok National Parks within the biome. However, this high area conserved in South Africa, belies the fact that half of the Savanna vegetation types are inadequately conserved, in having less than 5 % of their area in reserves. The Savannah Biome consists of 25 vegetation types, two of which are of relevance to this study, namely, Clay Thorn Bushveld and Mixed Bushveld (detailed below).

- Clay Thorn Bushveld

This vegetation type is widely distributed on the flat plains with black to red vertic clay soils in the northern parts of the North West Province. The key environmental parameter determining the distribution of this vegetation type is extreme clayey soils. The economic uses of this vegetation type are primarily for cultivated crops such as wheat, maize and sunflowers. Approximately 0.9 % of this vegetation type is conserved in various nature reserves, primarily in the Northern Province.

The vegetation is dominated by various Acacia species, including the Scented thorn *Acacia nilotica* and the Sweet Thorn Acacia karroo. Other woody species often encountered include the Buffalo thorn *Ziziphus mucronata*, *Sicklebush dichrostachys cinerea* and Wild raisin *Grewia flava*. Dominant grass species include Turf Grass *Ischaemum afrum*, Deck Grass *Sehima galpinii*, Vlei Bristle Grass *Setaria incrassate* and White Buffalo Grass *Panicum coloratum*. Overgrazing causes an increase in woody species, with an associated dominance of Pinhole Grass *Bothriochloa insculpta*, Three-awn Rolling Grass *Aristada bipartite*, Sweet Signal Grass *Brachiaria eruciformis* and Black-Seed Wild Sorghum *Versicolor* (WMB, 2002).

- Mixed Bushveld

This vegetation type represents a great variety of plant communities, where vegetation varies from dense, short bushveld to a rather open tree savannah. Key environmental parameters determining the structure of this vegetation type is conserved in various nature reserves, game farms and conservation areas throughout South Africa, including the Rustenburg Nature Reserve. Mixed Bushveld is characterised by coarse, sandy and shallow soil overlying granite quartzite, sandstone or shale.

On shallow soils Red Bushwillow *Combretum apiculatum* dominates the vegetation. Other trees and shrubs include Common Hook-thorn Acacia *Caffra*, Sicklebush *Dichrostachys cinerea*, Live-long Lannea discolor, Murula *Sclerocarya birrea* and various Grewia species. The herbaceous layer is dominated by grasses such as Fingergrass *Digitaria eriantha*, Kalahari Sand Quick *Schmidtia pappophoroides*, Wool Grass *Anthephora pubescens*, Silky Bushman Grass *Stipagrostis uniplumis* and various Aristida and Eragrostis species.

On deeper and sandier soils, Mixed Bushveld is characterised by stands of Silver Clusterleaf *Terminalia sericea*. The Peeling Plane *Ochna pulchra*, Wild Raisin *Grewia flava*, Weeping Wattle *peltophorum africanum*, and Wild Seringa *Burkea africana* are dominant tree species. Grass species include Broom Grass *Eragrostis pallens* and Cat's tail *Perotis patens*.

The majority of the pipeline servitudes follow existing pipelines and are therefore associated with disturbed vegetation, such as *Bidens pilosa, Tagetes minuta, Argemone subfusiformis* and *Pennisetum clandestinum*, adjacent to existing roads, railway lines and cultivated fields. Trees that occur along these servitudes include Acacia *nilotica*, *Dichrostachys cinerea* and *Ziziphus mucronata* (EMPR, 2002). Please refer to the Ecology Study which forms part of the 2002 EMPR (ref no. RNW(KL) 6/2/2/3164).

Figure 22 represents the various land uses of the Rustenburg area. All the infrastructural components associated with the RPM are highlighted in grey.

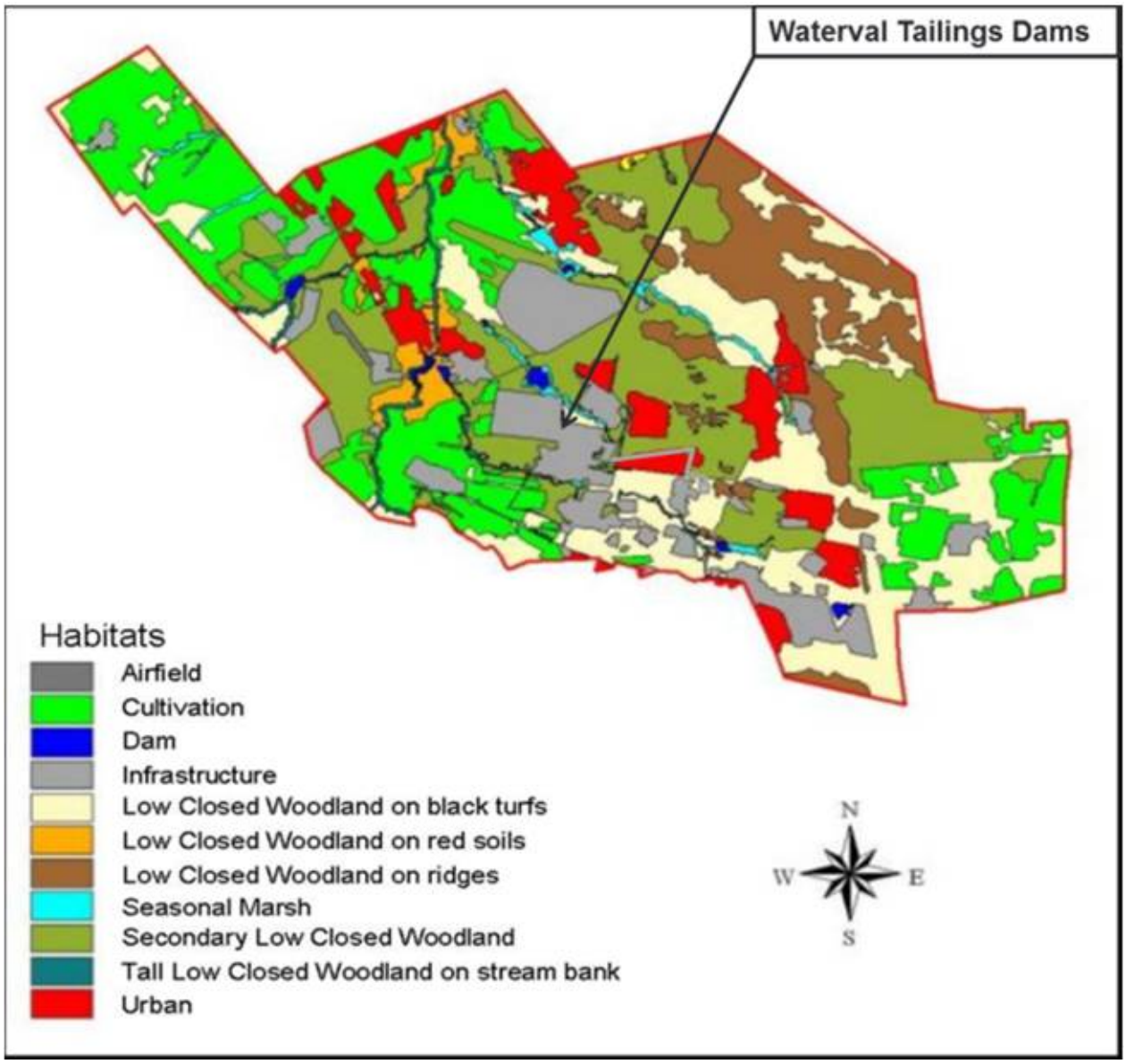


Figure 22: Natural Biotopes and Habitats of the Rustenburg Area (Anonymous, 2012)

4.6 Fauna

4.6.1 Avifauna

A total of 39 bird species were recorded during the ecological study conducted in 2002 (WMB, 2002). Six species are common water birds associated with aquatic habitats. These include the Reed Cormorant, Grey Heron, Egyptian Goose, Spurwinged Goose, Harmerkop and the Blacksmith Plover. Thirteen species are associated with grassland and bushveld habitats. These include the Common Quail, Swainson's Francolin, Helmeted Guineafowl, Crowned Plover, Forktailed Drongo, Lilac-breasted Roller, Chinspot Batis, Clapper Lark, Rufousnaped Lark, Neddicky, Crested Barbet, Southern Boubou and redbilled Quelea. The Crowned Plover particularly favours recently burnt grassland areas. Bird species such as the Blackshouldered Kite, Hadeda, Sacred Ibis, European Bee-eater, Cattle Egret, Doves, Blackeyed Bulbul, Lesser Striped Swallow, Grey Lourie, blackcrowned Tchagra, Olive Thrush, Redwinged Starling, red Bishop, Tawnflanked Prinia, Indian Myna, House Sparrow, masked Weaver and Fiscal Shrike are all common in rural suburbia and / or plantations. None of the bird species observed during the 2002 site visit are red data species (2002 EMPR [ref no. RNW(KL) 6/2/2/3164]) for detailed description of the Avifauna habitat.

4.6.2 Mammals

A comprehensive study was conducted in 2002 (WMB, 2002) in order to determine the mammals which are present in and around the mine lease area. The study confirmed the presence of six red data species which include the following: the short-eared Trident Bat *Cloeotis percivali*, the Dwarf Shrew *Suncus infinitesimus chriseos*, the Honey Badger *Mellivora capensis*, the Antbear *Orycteropus afer*, Southern African Hedgehog *Atelerix frontalis* and the Pangolin *Manis temminckii*. Scrub hare droppings, Black-backed Jackal and domestic cattle tracks were only evidence of mammals that were observed during the site visit to the study area during the 2002 Avifauna study therefore the mammals present on the site are not limited to the list of mammals provided.

The fauna in the area appears to have been impacted on by the mining activities, as well as the continual heavy vehicle movement, in the surrounding area. However, the prime impact on the fauna in the area is attributed to the disturbance of squatters living in the surrounding area. Although no snares were detected during the field surveys, poaching should not be ruled out as a further limitation to the fauna in the area.

4.7 Sensitive Landscapes

Sensitive habitats include archaeological landscapes, visual resources at the site, vegetation and animal life. According to the North West Biodiversity Conservation Assessment Report (2008), Granite koppies also referred to as norite koppies are characterised by a bushveld type that is considered to be endemic in Rustenburg as it provides habitat for special red data insect species Lepidoptera. The current mining of the said koppies (not by RPM) is not only causing loss of biodiversity but also leading to the degradation of the visual aspect of the area (Draft Rustenburg IDP, 2012-2017). The general landscape of the Rustenburg mine lease area and the surrounding residential, industrial and mining activities are viewed as contributing to a distinct sense of place in the Rustenburg area. According to the 2002 EMPR (ref no. RNW(KL) 6/2/2/3164) the proposed infrastructure will not impede on wetlands in the mine lease area. The proposed pipeline route has however been altered since the year 2002 hence a hydrological study will be conducted to determine if any wetlands will be disturbed during the project. The rivers which intersect the mine lease area can be considered a sensitive landscape.

4.8 Hydrology

The proposed pipeline crosses the Klipgatspruit at two points. In addition a proposed holding dam (PCD) and associated infrastructure located in the vicinity of the Waterval TSF is expected to lie in close proximity to the Klipgat Return Water Dam. The pipeline crosses a catchment divide, with the WLTR Plant lying within the Hoedspruit catchment to the east.

4.8.1 Surface water

The non-perennial Klipgatspruit flows in a western to north-western direction along a flat to moderate slope. Due to the relatively flat topography the floodplain is expected to be wide, and the watercourse meandering. The Klipgat Return Water Dam is located on the watercourse adjacent to the Waterval tailings and covers an area of approximately 25 ha. The Klipgatspruit contributes to the perennial Hex river located 4 km north-west of the Waterval tailings. The non-perennial Hoedspruit begins adjacent to the eastern portion of the WLTR Plant. The river drains east via a flat to moderate topography and contributes to the perennial Sterkstroom 8 km's east of the site.

4.8.2 Surface water quality

It is understood that surface water monitoring has been undertaken to date at the site. To determine the baseline surface water quality, these results will be reviewed. This will be utilised to guide on-going and additional monitoring (for example at the new proposed PCD), with recommendations made to improve the monitoring programme where necessary.

4.8.3 Surface Water Study (Hydrological Assessment)

The following studies / activities will be carried out by the hydrological specialist in the EIA Phase in order to determine the baseline conditions as well as identify potential impacts which may arise as a result of the project.

- Hydrological Impacts: Due to the potential for the proposed development to impact the flow regime in the area through the transfer of water between watercourse catchments, and the development of the stormwater dam, an assessment of the potentially impacted hydrological regime will be determined through the use of hydrological modelling.
- Floodline Assessment: The proposed stormwater dam and pipeline is expected to lie in close proximity to watercourses (with the pipeline crossing the Klipgatspruit at two points). To determine the impacts of peak flows on these developments, existing flood line, wetland hydrological information for the project area will be reviewed and findings assessed in the EIR.

Water Balance: Due to the influence of the proposed developments on the hydrological regime of the catchments, the water balance previously compiled for the mine (EMPR, 2002) will be updated accordingly to take into account the influence of water transfers and the proposed PCD.

4.9 Geohydrology

4.9.1 Rustenburg

RLM has a large reservoir of subterranean water in the form of fractured aquifers and dolomitic compartments. Furthermore underground springs also supply wetlands, pans and dolomitic eyes with water. The risk of groundwater pollution is increased by discharges from slimes dams and waste from surrounding mining and industrial activities (Draft Rustenburg IDP, 2012-2017).

4.9.2 RPM

Based on the EMPR (EMPR, 2002), the aquifer system is expected to be geologically controlled with groundwater intercepted in the zones of deeper weathering adjacent to dykes or faults in the area. The aquifer system comprises a low yielding semi-confined to confined weathered and / or fractured rock aquifer occurring at the base of the weathered zone with higher yielding fracture zones associated with the faulting and / or dyke contacts.

The 2002 study by SRK indicated that the area is expected to have a low groundwater potential. Groundwater depth is expected to be between 3m and 26m. It is noted that groundwater is generally poor and unacceptable for domestic use. However, there is reported use of borehole water in the townships of KwaPhotsaneng and Thekwane located directly between the Waterval TSF and the WLTR Plant. These have the potential to be impacted by any contamination arising due to the development.

4.10 Groundwater study

The following studies will be undertaken to further detail the current baseline conditions of the regional groundwater:

- Historical review: Groundwater monitoring of available wells has been conducted previously. These results will be reviewed to determine the baseline groundwater quality.
- Hydrocensus: Although a hydrocensus was conducted previously, this will be updated to include current water users and boreholes expected to be influenced by the project.

4.11 Air Quality

4.11.1 Climate

The Rustenburg region has a sub-tropical climate that experiences hot, wet summers and mild dry winters. Due to its location at a high altitude, temperatures during winter nights can drop substantially. The amount of rainfall received can be fairly erratic with large differences from one year to the next. Rainfall events are sometimes associated with severe thunderstorms.

4.11.1.1 Atmospheric Dispersion

Atmospheric transport within the area occurs both vertically and horizontally. Vertical transport is primarily due to deep convection. This convection transports air and any air pollutants contained therein from the surface into the upper atmosphere. Vertical motion is eventually inhibited due to the absolutely stable layers found preferentially at ~700hPa, ~500hPa and ~300hPa on no-rain days. These stable layers trap pollutants at lower atmospheric levels and so influence the transport of pollutants over the whole of southern Africa (Cosijn and Tyson, 1996; Garstang et al., 1996)

On a more local scale, vertical motion and hence dispersion of pollutants is inhibited by surface inversions that form during the night. These inversions are a result of radiational cooling at the surface and are most pronounced just before sunrise. In the presence of sunlight the inversions begin to break down through convective heating and the height of the mixed layer is increased (Cosijn and Tyson, 1996; Tyson and Preston-Whyte, 2000).

In terms of horizontal transport, local winds may transport pollutants within the vicinity of their source. These include: anabatic and katabatic winds; and valley and mountain winds (Tyson and Preston-Whyte, 2000). On a larger scale, various synoptic systems affect atmospheric circulation over the Rustenburg region as well as circulation over the whole of southern Africa. These systems include: continental high pressure systems, ridging anticyclones, westerly waves and easterly waves, which transport air and pollutants over larger distances (Garstang et al., 1996; Tyson et al., 1996).

In the Rustenburg region, transport associated with continental high pressure systems occurs all year round, but with greater frequency during winter. These anticyclonic circulations are associated with subsidence of air resulting in clear, dry and stable atmospheric conditions. Such stable conditions are conducive to the accumulation of atmospheric pollutants, hence limiting the dispersion potential of the atmosphere. Easterly waves exhibit an annual cycle, peaking in summer, with extremely seldom occurrences in winter. These waves are responsible for transporting moisture into the region, creating rainfall. Transport associated with ridging highs and westerly waves dominates during winter (Garstang et al., 1996; Tyson and Preston-Whyte, 2000).

Recirculation is also important in the transport of pollutants and occurs frequently over southern Africa due to the high frequency of anticyclonic circulations (Garstang et al., 1996; Freiman and Piketh, 2003). Recirculation occurs when air is transported away from its source and returns in the opposite direction after rotating cyclonically or anticyclonically. Recirculation can occur at a number of scales from sub-continental to regional, and an interaction between different scales of wind systems results in further recirculation (Tyson et al., 1996; Tyson and Preston-Whyte, 2000; Freiman and Piketh, 2003).

4.11.1.2 Local Wind Field

Meteorological data was sourced from the South African Weather Services' Rustenburg station for 2009 to 2011. This station is located ~7 km west-north-west of the Waterval TSF and is positioned at a similar altitude, representing a good comparative data set.

Wind roses are useful for illustrating the prevailing meteorological conditions of an area, indicating wind speeds and directional frequency distributions. In the following wind roses, the colour of the bar indicates the wind speed whilst the length of the bar represents the frequency of winds blowing from a certain direction (as a percentage).

In the Rustenburg area (according to **Figure 23**), winds are predominantly from the south-west (16 % of the time) and the west-south-west (9 % of the time). A small northerly and north-easterly wind component is also evident. Winds are generally weak to moderate, with wind speeds ranging from 0.5 to 5.7 m / s. Calm conditions are experienced for approximately 20 % of the time.

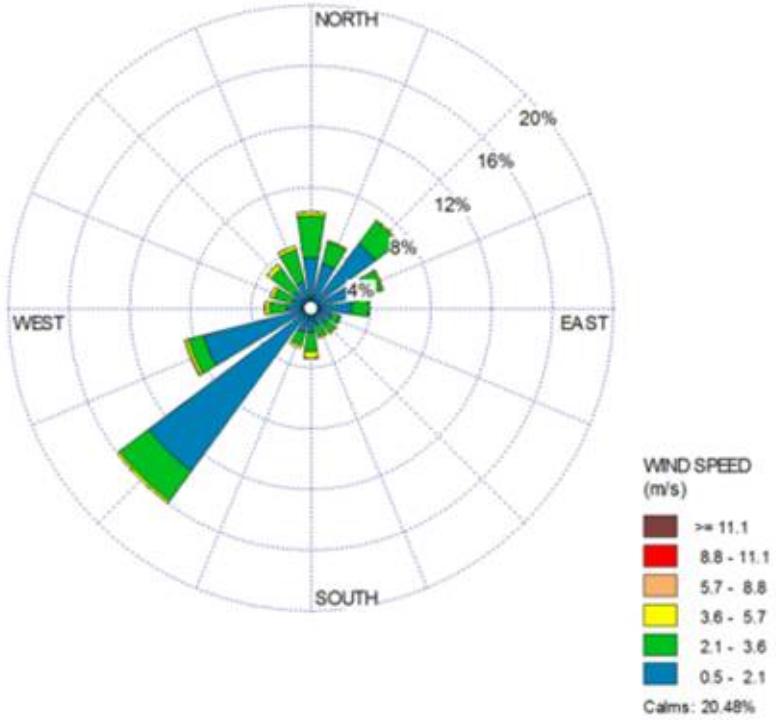
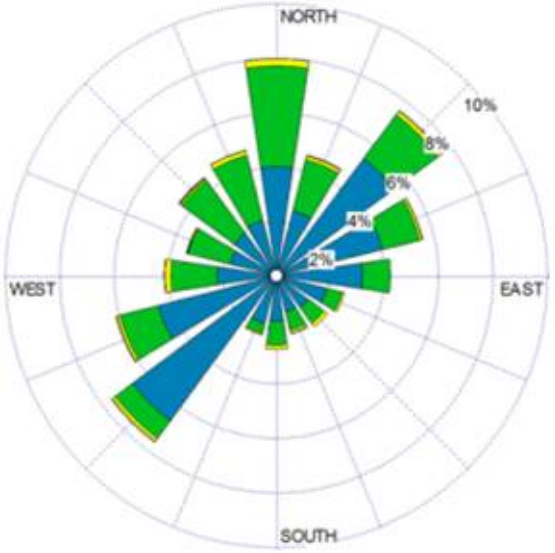
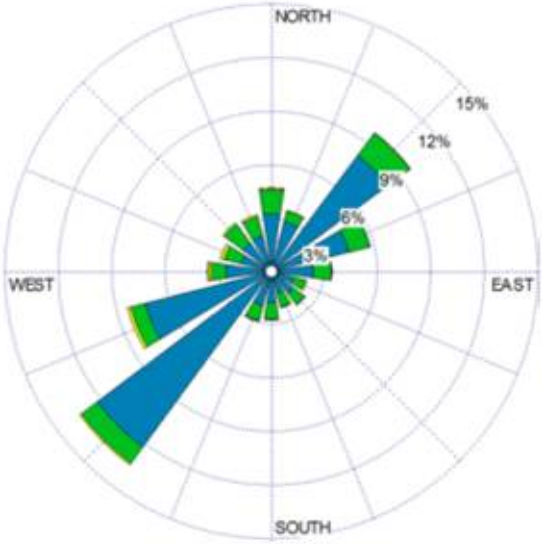


Figure 23: Surface wind rose plot for Rustenburg for 2009 to 2011

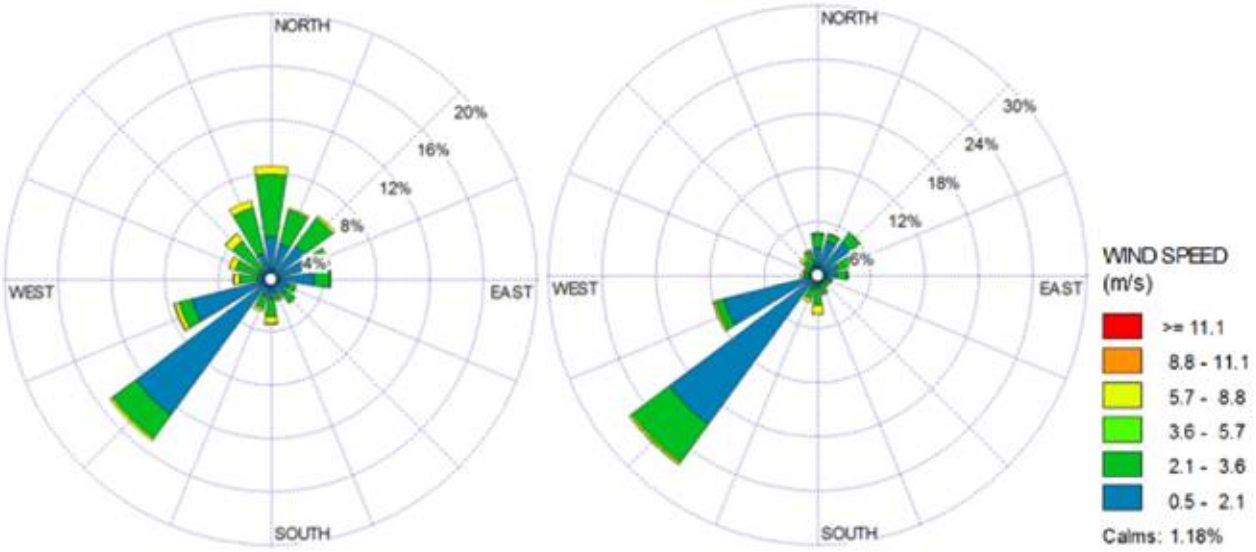
Seasonal variations in winds at Rustenburg are represented in **Figure 24**. During summer (December to February) wind direction varies quite considerably, with winds experienced from all directions. Winds from the north, north-east, south-west and west-south-west dominate. Winds are calm to moderate with wind speeds of up to 5.7 m / s. During autumn (March to May), winds from the south-west (13.5 % of the time) and north-east (10 % of the time) are predominant. Smaller west-south-westerly, northerly and east-north-easterly components are also evident. As in summer, wind speeds remain calm to moderate. During winter, south-westerly flow dominates, with winds from this direction blowing for 26 % of the time. This flow is a result of westerly waves, in the form of cold fronts that pass over the region at this time. A very small, yet stronger southerly wind component is also evident. Winds remain calm to moderate. During spring, winds are similar to those experienced during winter; however, a northerly wind component is introduced.



SUMMER (Dec – Feb)



AUTUMN (Mar – May)

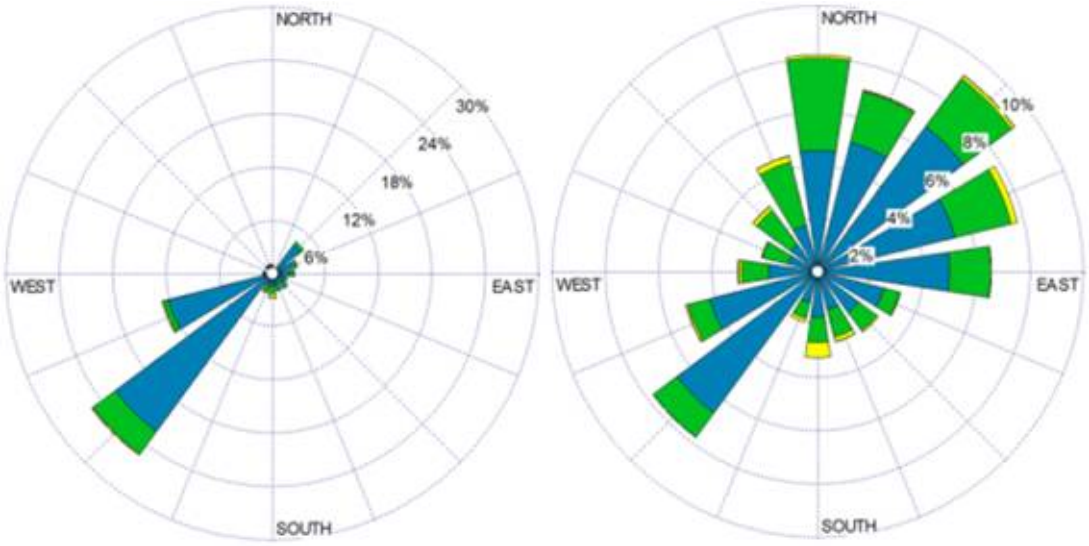


WINTER (Jun – Aug) SPRING (Sep – Oct)

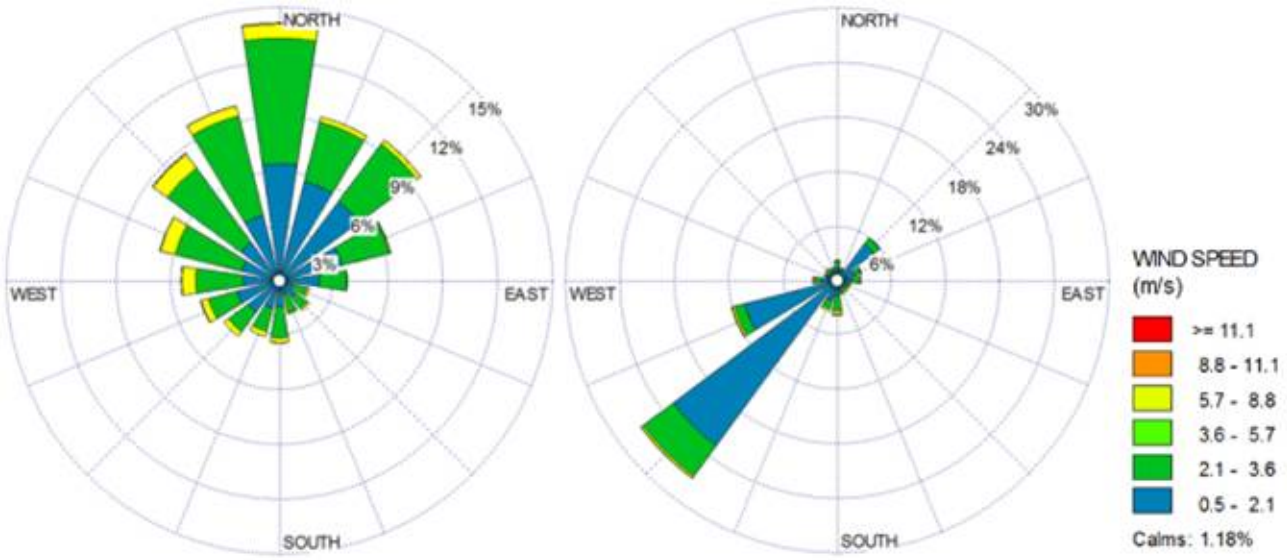
Figure 24: Seasonal surface wind rose plots for Rustenburg for 2009 to 2011

Diurnal variations in winds at Rustenburg are presented in **Figure 25**. At night (18:00 to 06:00) winds from the south-west dominate, with a smaller west-south-westerly component. Winds are relatively calm at this time. After sunrise, the south-westerly winds weaken slightly and northerly, north-easterly and easterly winds dominate. Wind speeds also increase slightly. After midday, the north-westerly component disappears and winds from the north dominate. Wind speeds are greatest during the afternoon, when convective mixing is at its greatest as a result of surface heating.

The dispersion of emissions is much less during the early morning hours as a result of calmer wind speeds. During winter the concentrations of pollutants experienced at the surface at this time, may also be augmented by the formation of surface inversions which potentially trap pollutants and prevent them from being dispersed into the atmosphere.



00:00 to 06:00 06:00 to 12:00



12:00 to 18:00 18:00 to 24:00

Figure 25: Diurnal surface wind rose plots for Rustenburg for 2009 to 2011

4.11.1.3 Temperature

Figure 26 represents the average, minimum and maximum temperatures for Rustenburg, calculated from hourly average temperature readings, recorded at the South African Weather Service (SAWS) Rustenburg meteorological station from 2009 to 2011. The maximum recorded temperature was 30.3°C in January 2009 and November 2011 and the minimum temperature was 5.4°C recorded during June 2010. Average temperatures range quite considerably between summer and winter months, with an average summer temperature of 23°C and an average winter temperature of about 10°C.

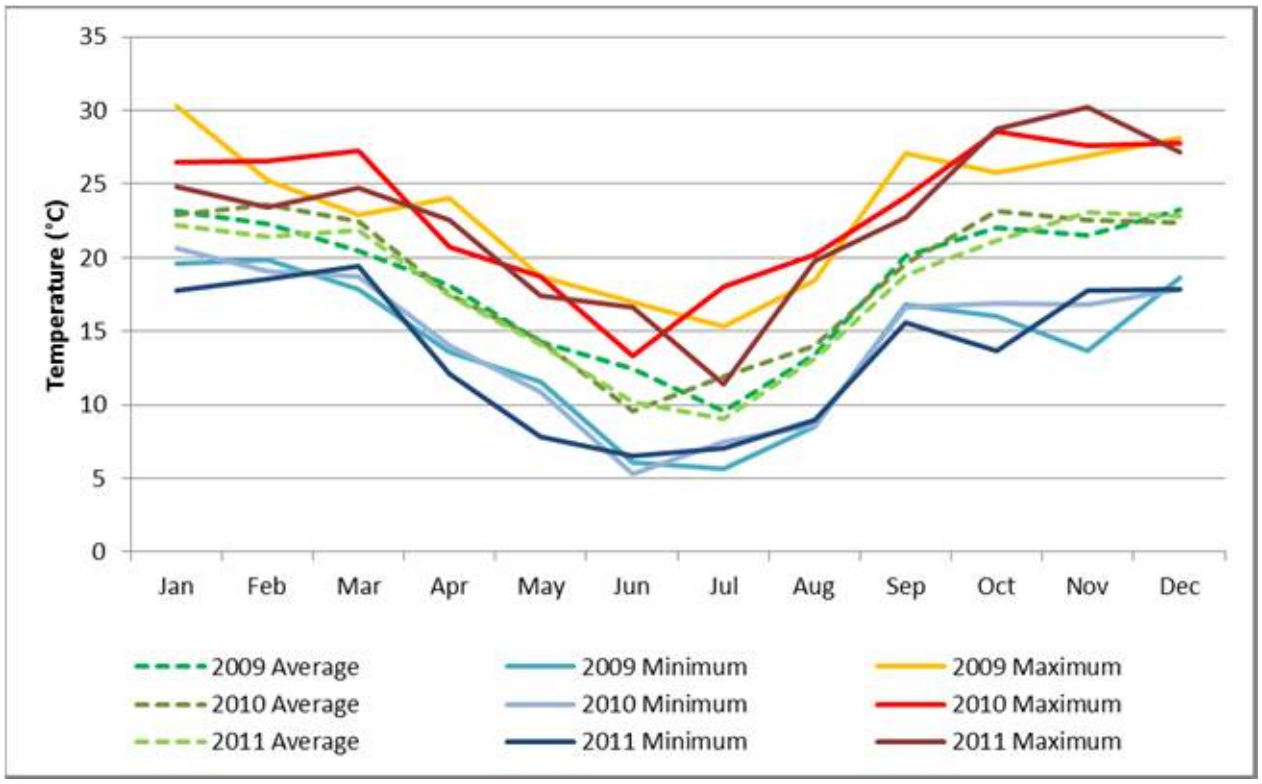


Figure 26: Average, maximum and minimum temperatures for Rustenburg, calculated from hourly average measurements at the Rustenburg SAWS meteorological station

4.11.1.4 Rainfall

Monthly rainfall figures for Rustenburg from 2009, 2010 and 2011 are plotted in **Figure 27**. The highest rainfall is experienced during the summer and autumn months. The lowest rainfall occurs during July, August and September. Rainfall has the potential to remove pollutants from the air, especially particulates, thereby improving the air quality situation in high rainfall areas. During the summer months, air quality in the Rustenburg area may improve due to the high rainfall experienced. Drier conditions, together with increased domestic fuel combustion in the region, may augment the concentration of ambient pollutants during winter.

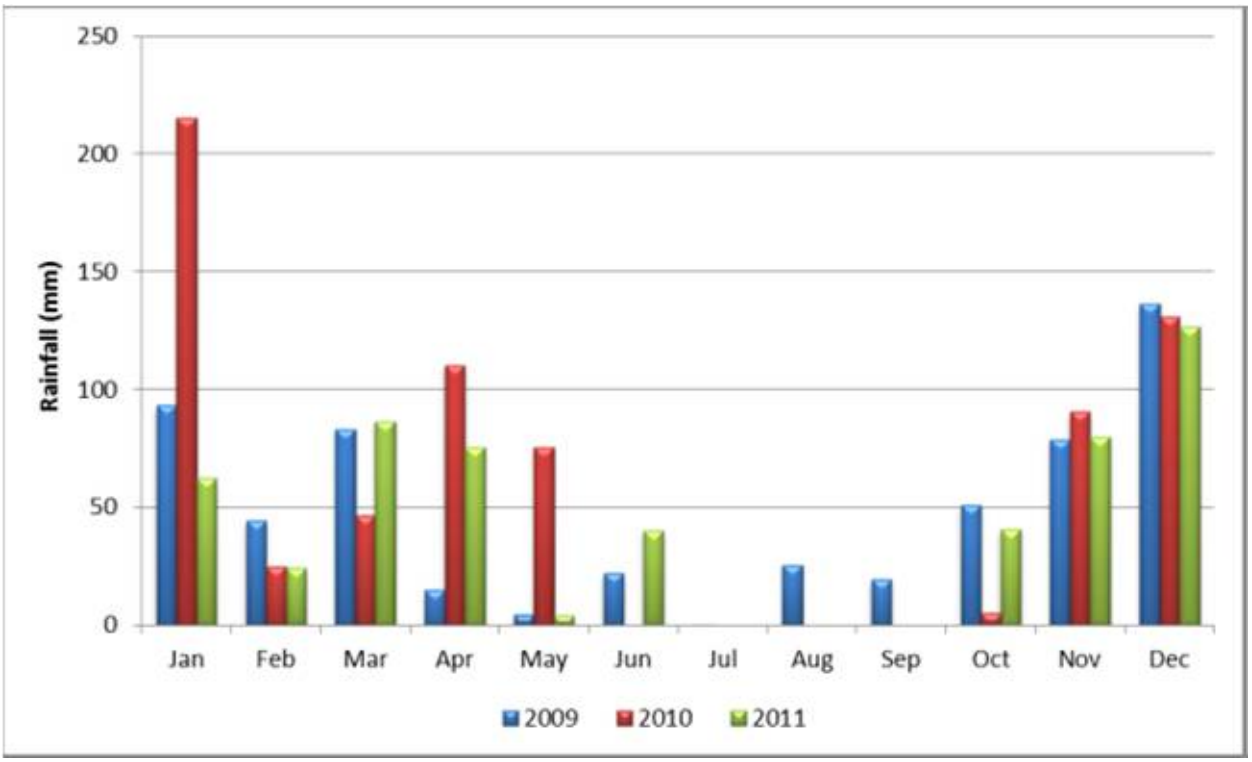


Figure 27: Total monthly rainfall for 2009, 2010 and 2011 recorded at the Rustenburg SAWS meteorological station

4.11.2 Regional Air Quality

Rustenburg forms part of the newly declared Waterberg Priority Area, an air pollution hotspot area prioritised as a region associated with poor air quality and elevated concentrations of criteria pollutants (such as nitrogen oxides, sulphur dioxide and particulate matter). Major emissions sources in the Rustenburg area include mining activities; manufacturing industries; agricultural activities; domestic fuel burning; biomass burning; waste treatment and disposal; and vehicular activities (Gondwana, 2011) . Primary emissions from these sources include sulphur dioxide, nitrogen oxides, carbon monoxide, particulate matter and volatile organic compounds. Suspended particulates are of greatest concern in the Rustenburg area as a result of mining activity. The heavy metal loading (in the form of chromium, vanadium and nickel) of these particulates creates greater concern, such that the Rustenburg area has been identified as an area high in chromium and nickel emissions (RLM, 2011).

The main emission of concern from the WLTR operations is particulate matter (in the form of dust). Particulate matter (PM) refers to solid or liquid particles suspended in the air. PM varies in size from particles that are only visible under an electron microscope to soot or smoke particles that are visible to the human eye. PM contributes greatly to deteriorations in visibility, as well as posing major health risks, as small particles (PM10) can penetrate deep into lungs, while even smaller particle sizes (PM2.5) can enter the bloodstream via capillaries in the lungs, with the potential to be laid down as plaques in the cardiovascular system or brain. Health effects include: respiratory problems, lung tissue damage, cardiovascular problems, cancer and premature death. Acidic particles may damage buildings, vegetation and acidify water sources (US EPA, 2011).

Sensitive receptors are identified as areas that may be negatively impacted on due to emissions from the WLTR operations. Examples of receptors include, but are not limited to, schools, shopping centres, hospitals, office blocks and residential areas. The sensitive receptors identified in the area surrounding the WLTR operations include: the Rustenburg community located 4 km to the west of the TSF; the Rustenburg rural

community located 1 km north-west of the TSF; the Waterkloof community located 3.5 km to the south of the TSF; the Entabeni community located 0.8 km to the north-east of the TSF; the Mfidikwe community located 1.5 km to the east of the TSF; the Bokamoso community located 1.4 km to the east of the TSF; the Photshaneng community located 1 km to the west of the WLTR Plant; and the Nkaneng community located 1 km south-west of the WLTR plant.

4.12 Noise

The area around Rustenburg and Kroondal is characterised by the presence of a large number of mining related activities. Industrial noise forms part of the present ambient noise climate in the environment. The result of the industrial character of the present ambient noise climate in the pre-mining environment is, that any new mining related developments will probably have an impact localised to the immediate vicinity of the development (EMPR, 2002).

4.13 Visual Aspects

The project site is located within a “mining belt”. The mining / processing activities along with the infrastructure, which support the mines, such as the proposed infrastructure, dominate the landscape characteristics of the immediate area around the proposed project sites. Beyond the mining belt, a series of koppies and hills associated with the Magaliesberg, protrude predominantly above the flat plain with savannah type vegetation and farmland. The said topographical features add to an aesthetically pleasing natural dimension to the scene. These factors when viewed together give the region a strong sense of place.

The visual impact attributed to the proposed project can be considered minimal as the proposed infrastructure will be located alongside other mining supporting infrastructure. The proposed pre-treatment plant will be located directly adjacent to the west Waterval TSF. The proposed pre-treatment plant will be dwarfed by the west dam of the TSF. The pipeline route is proposed along an existing servitude parallel to an existing compressed air pipeline. The associated visual impact can therefore be considered extremely minimal or non-existent. The proposed booster station is to be located adjacent to the Siphumelele Shaft and will therefore fit in with the sense of place, however, the location is relatively close to a community meaning the visual impact will be of a greater significance when compared to the other proposed infrastructure. The significance of the impact will be rated during the EIA phase of the project.

The IsaMills™, which will be installed at the existing WLTR, will be positioned within an existing matrix of infrastructure. The IsaMills™ will not contribute to the visual disturbance of the site. Please refer to the 2002 EMPR [ref no. RNW(KL) 6/2/2/3164], which includes a Visual specialist study, for further detail.

4.14 Blasting and Vibrations

The RPM mine is an underground mine and the mine lease area is therefore extensively undermined. Underground blasting does occur during the daily operations of the mine. Blasting is used in order to loosen the rock contained in the walls of underground tunnels. Rock blasting does release a shockwave throughout the immediate geology. The level of vibration associated with blasting on the mine is well understood by on-site engineers and geologists. Continual monitoring is conducted on the rock stability in the underground tunnels in order to avoid tunnel collapse or above ground subsidence. No blasting activities will be required during the construction and operational phase of the proposed project.

4.15 Archaeological, Cultural and Heritage Significance

During the EMPR conducted in 2002 [ref no. RNW (KL) 6/2/2/3164], an Archaeological study was undertaken, by Prof Huffman from the University of the Witwatersrand, in which various findings were noted. Fifty sites and occurrences of Archaeological, cultural and heritage importance were discovered on the RPM mine lease area, in and around the current project area.

The findings of the study were categorised into the following groups:

- Middle Stone Age

Materials discovered on the site which result from human activity dating back to ca 250 000 to 25 000 years are considered to be articles which form part of the Middle Stone age period.

- Iron Age

Includes material remains related to the last 2 000 years, which are associated with the Bantu-speaking people. The Iron Age way of life was characterised by the farming of sorghum and millets, the raising of domestic livestock and the creation of metal items (EMPR, 2002). Please refer to the archaeological study, contained in the 2002 EMPR.

Articles discovered during the 2002 study include, but are not limited to, the following:

- Stone Age flakes;
- Pottery;
- Rock engravings;
- Village boundary wall; and
- Metal items.

- Historic

Materials which remain on-site which result from human activity dating back to AD 1850, including artefacts, human skeletons and structures (EMPR, 2002).

Figure 28 represents the sites at which articles / materials of archaeological importance were discovered during the archaeological study. The WLTR Plant, represented in brownish yellow on **Figure 28**, is clearly located within a close proximity to sites 40-44 however, the WLTR has already been authorised and constructed in terms of the 2002 EMPR. The current project involves the inclusion of 4 IsaMills™ plants within the WLTR Plant hence the project will not further impact on the archaeological sites identified. The proposed pipeline represented route in blue on **Figure 28** is within a close proximity to archaeological sites 1, 45, 46, and 47. The proposed pipeline however, is routed through an existing servitude through which an air pipeline currently exists. It should be noted that a formal graveyard is located to south of the proposed pipeline route, at the following co-ordinate: 25° 40' 19.19" S 27° 20' 04.08" E. The graveyard is situated approximately 200 m to the south of the proposed route (**Figure 29** and **Figure 30**) and did not exist during the 2002 study and is not represented in **Figure 28**. The graveyard is however securely fenced and therefore impacts of the construction activities on the graveyard are not anticipated.

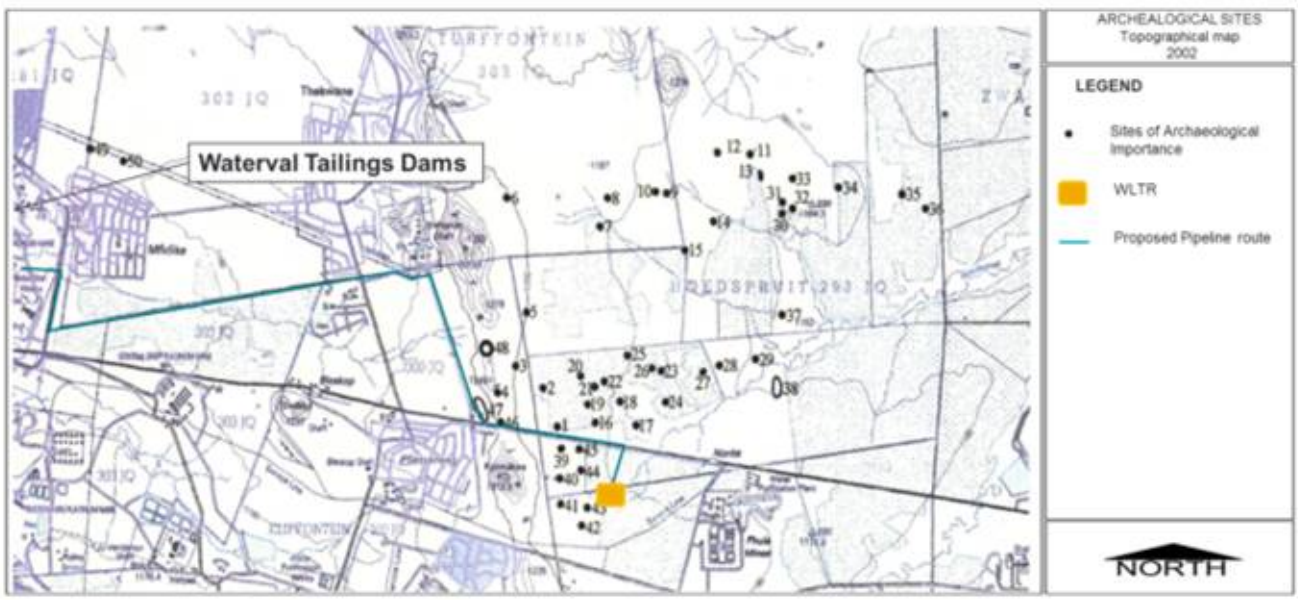


Figure 28: Location of Archaeological sites (EMPR, 2002)

Figure 29: Formal graveyard (left)

Figure 30: View of headstones inside formal graveyard

4.16 Socio-Economic Profile

4.16.1 Regional Context

The proposed re-processing of the Waterval TSF's Project is located within the RLM, within the Bojanala Platinum District Municipality of the North West Province. Geographically, the province is bordered by Botswana to the north and the Northern Cape, Free State, Gauteng and Limpopo to the west, south, east, and north-east respectively. The North West was created in 1994 by the merger of the former homeland, Bophuthatswana, and the former Western Transvaal region. The largest centres within the province include Potchefstroom (Capital), Orkney, Klerksdorp, Brits, and Rustenburg, which are key mining and economic centres for the province.

The key economic activity, and key contributor to the provincial economy within the North West Province is mining including platinum, gold, uranium, and diamonds, and mining related activities,. The second largest contributor to the local economy is farming, including sheep, cattle and game farms in the northern regions, and maize, sunflowers, tobacco, cotton and citrus crops in the southern and eastern regions. The key development priorities for the North West have been identified as (North West Provincial Growth And Development Strategy 2004 to 2014):

- Growth and Investment,
- Agricultural and Rural Development,
- Mining and Energy,
- Manufacturing,
- Tourism,
- Construction and Infrastructure,
- Small, Medium and Micro Enterprises (SMME), and
- Training and Skills Development.

The Bojanala Platinum District Municipality is located in the north-eastern side of the province, and shares a boundary with the Waterberg and West Rand District Municipality's (north and south-east respectively), the City of Tshwane to the east, and the Dr Kenneth Kaunda and Ngaka Modiri DMs, to the south and west respectively.

The total population of the Bojanala Platinum District Municipality is approximately 1 058 060 (Statistics SA, Community survey, 2007), which is approximately 33 % of the population of the North West Province. Approximately 92 % of the DM population fall within the Black African ethnic group and 7 % in the White ethnic group. The majority of the population speak Setswana (63 %), Afrikaans (7 %), Xitonga (7 %), and Sepedi (6 %) (Statistics SA, 2001 Census Data).

4.16.2 Local Context

The RLM is characterised by the mining of platinum around the key centre of Rustenburg. The poverty levels are reported to have been at 25.25 % (BPDM Socio-economic and service level database, 2003, RLM IDP, 2011 / 2012) in the Rustenburg area, and unemployment levels are high in many rural areas. Only 22 % of the total population of the RLM are registered as employed, and the current unemployment rate of the LM is 32 % (Statistics SA, 2001 Census Data).

The population of the RLM is 449 775, comprising 54.1 % males and 45.9 % females (Statistics SA, Community survey, 2007). 87 % of the population is Black African, and 12 % are White, indicating a slightly higher concentration of white people in this region, when compared with the provincial average. This may be a result of the intense mining activities in the Rustenburg area, and a result of the pre-1994 government's policies.

The population in the RLM appears to be dominated by a relatively high percentage (67%) of people between the ages of 18 and 65 (39% between 19 and 39), when compared with 30% of the population is under 18 years of age. This may be indicative of the labour demands of the platinum mines, as 26 % of the population (45 % of the labour force) is employed in the mining sector, 89 % of which are Black African and 11 % are White. This is also reflected by the increasing levels of in-migration, as almost 200,000 people moved to the district

municipality in 1996, and over 1.5 million people moved into the RLM according to the 2001 census data (note this information is not available for the 2007 or later). It is also noted that this is a migrant population, and so is unlikely to remain in the area, and therefore these numbers may fluctuate annually.

Despite the growing population and economic development, the service levels within the RLM remain low to moderate, with inequitable distribution of resources and services, which typifies the South African municipal service landscape. The population is distributed between municipal settlements (60 %), mining hostels (5 %), Bafokeng tribal settlements (24 %) and rural areas (11 %). The level of service provision is reflected by the following statistics (RLM IDP 2011 / 12):

- Only 21 % of households have piped water into the dwelling, 41 % having piped water into their yard, and 10 % receiving water form a vendor.
- 41 % of households have flush toilet facilities, whereas 45 % of households rely on pit latrine systems and 13 % have no toilet facilities.
- Refuse removal services appear to be limited, as 44 % of households have refuse removed by the RLM, 48 % rely on their own dumps, and 8 % have no rubbish disposal.

70 % have access to electricity for lighting, and 30 % of households still rely on candles or paraffin.

4.16.3 Site Context

The re-processing of the Waterval TSF's project is located at the RPM, near the town of Rustenburg. The communities in this area are generally peri-urban in nature with the town of Rustenburg area provides a centralised urban environment, with services and housing for the majority of people living around the mining operations. The RLM, however, does not meet all the basic needs of the local population in terms of water provision and housing. The RLM therefore is likely to partially rely on the local mining companies for a portion of the service provision and partnerships in education and social development.

The proposed pipeline route appears to fall within Royal Bafokeng land[3] and within RLM-owned land. This land has potentially been designated for low-density housing, mining and agricultural activities by the Royal Bafokeng Nation Masterplan[4]. This is still to be confirmed with the Royal Bafokeng Nation during the Social Impact Assessment (SIA).

The Waterval Tailings facility, concentrator, Hoedspruit TSF and pipeline route are in close proximity to Mfidikwe, Thekwane, Photshaneng and Nkaneng communities. According to the Rustenburg SEAT Report (2009) Thekwane, Mfidikwe and Photsaneng fall under the Royal Bafokeng Nation whilst Bokamoso is a 'Local Municipal Township' and Nkaneng as an 'Informal Settlement'. Refer to **Figure 31** and **Figure 32** below for local communities.

[3] The Royal Bafokeng Nation is a group of approximately 150 000 people who make up the Bafokeng people, and have lived in the Rustenburg area since before the discovery of platinum in the area, and were removed from the land during Apartheid.

[4] Royal Bafokeng National Masterplan - http://www.bafokeng.com/sites/default/files/Masterplan%20Factsheet.pdf

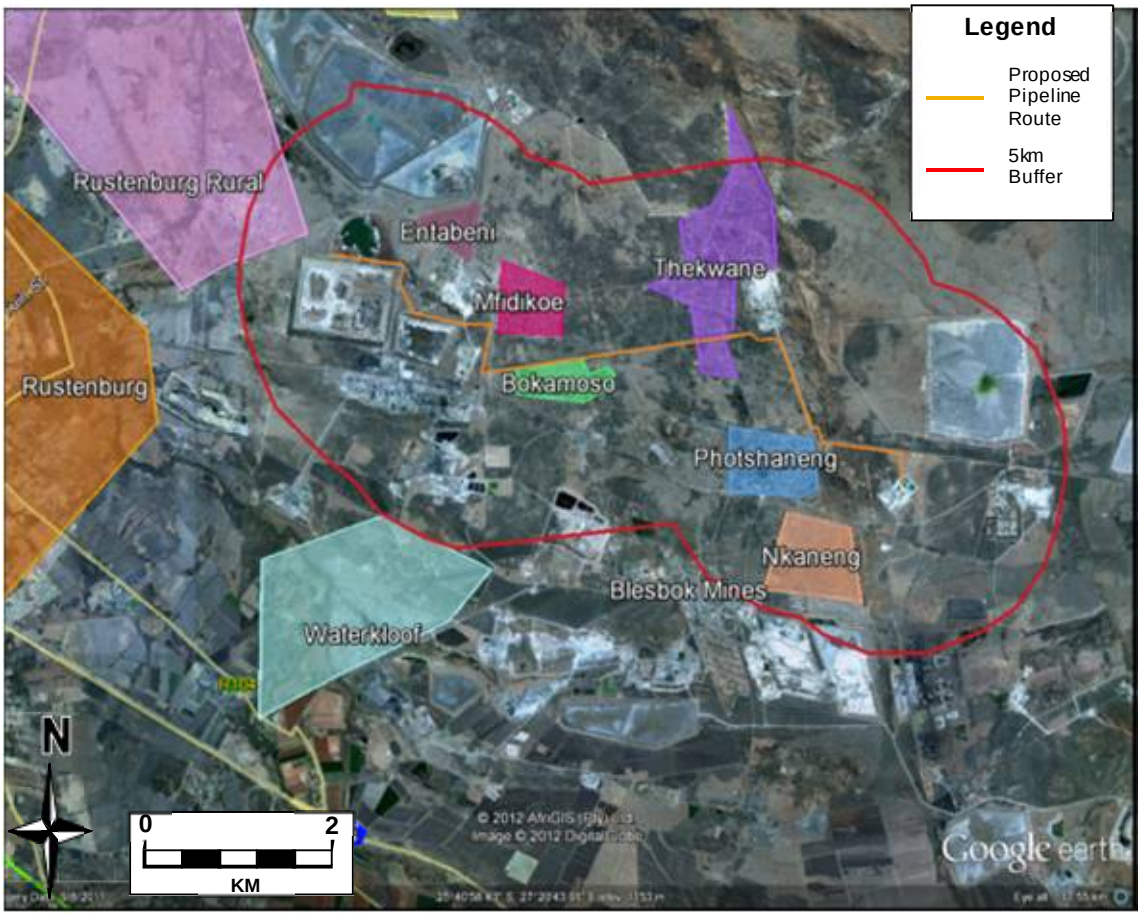


Figure 31: Communities within 5km of the pipeline site

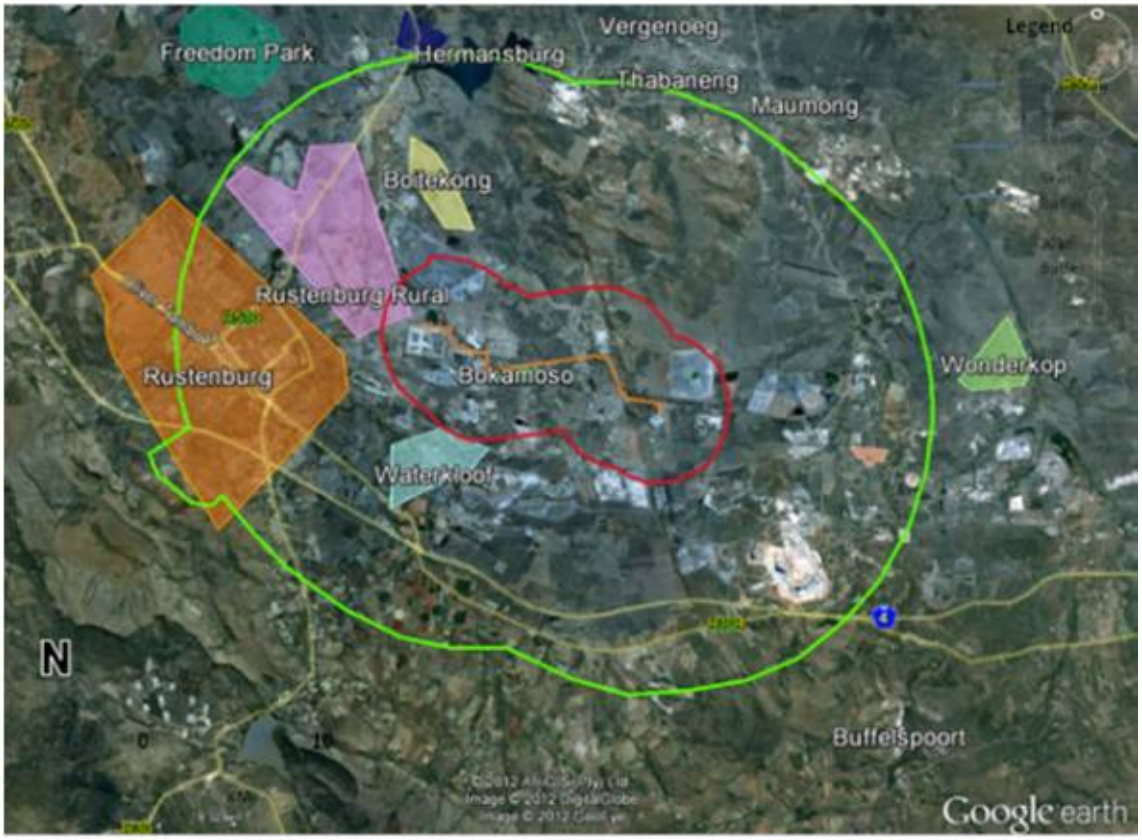


Figure 32: Communities within 20km of the pipeline site

5 Governance Framework

5.1 The Constitution of South African (No. 108 of 1996)

The Constitution of South Africa provides for an environmental right (contained in the Bill of Rights, Chapter 2) and includes implications for environmental management. In terms of **Section 7**, a positive obligation is placed on the State to give effect to the environmental right. The environmental right states that:

"Everyone has the right –

- To an environment that is not harmful to their health or well-being; and
- To have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that:
  - Prevent pollution and ecological degradation;
  - Promote conservation; and
  - Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development."

5.2 Minerals and Petroleum Resources Development Act (No. 28 of 2002)

The main objective of the MPRDA is to recognise the sovereignty of the State over all the mineral and petroleum resources in South Africa and to promote equitable access to the country's resources. The MPRDA also allows for previously disadvantaged persons to enter the minerals and petroleum industry and benefit from the exploitation of the country's minerals.

The Act ensures that holders of existing and new mining and production rights contribute towards the social-economic development of the areas in which they operate, promoting economic growth, employment and advance the social and economic welfare of all South Africans.

Although RPM has a mining right under the MPRDA and an approved Environmental Management Programme Report (EMPR), certain activities of the proposed re-processing of the Waterval TSF's project, are not included therein. In accordance with section 102 (amendment of rights, permits, programmes and plans) of the MPRDA, an EMPR amendment is required. This process includes assessing the baseline project area, identifying anticipated environmental and socio-economic impacts and developing mitigation measures to alleviate any potential negative impacts associated with the project, and report submission to the competent authority. Part 3, Sections 49 – 52 of the MPRDA further define the reporting requirements when undertaking and EMPR amendment process. To ensure a diligent environmental authorisation process is completed, the said statutory requirements will be included and incorporated into the process and all resulting reports.

The North West DMR will be the competent authority responsible for authorisation the EMPR amendment process in accordance with the MPRDA.

The re-processing of the Waterval TSFs and Klipfontein TSF and associated infrastructure (pipelines, WLTR, Hoedspruit TSF) was authorised by the DMR as part of an amendment to the existing Environmental Management Programme (EMPR) in 2002. Although authorised, the re-processing of the Waterval tailings has not yet commenced. Recent changes to proposed infrastructure and the layout of the Waterval component of the project require the EMPR to be amended again.

5.3 National Environmental Management Act (No. 107 of 1998)

The NEMA is South Africa's overarching environmental legislation and has, as its primary objective, to provide for co-operative governance by establishing principles for decision making on matters affecting the

environment, institutions that will promote co-operative governance and procedures for co-ordinating environmental functions exercised by organs of state and to provide for matters connected therewith (Government Gazette, 1998).

The Act provides for the right to an environment that is not harmful to the health and well-being of South African citizens; the equitable distribution of natural resources, sustainable development, environmental protection and the formulation of environmental management frameworks (Government Gazette, 1998).

The NEMA ensures that specific activities are designed and implemented in a sustainable and environmentally friendly manner, thereby assisting in achieving South Africa's constitutional goal for a better quality of life for all now and in the future. Therefore, it is essential that industries (including mines) improve the efficiency and use of resources, and improve on the level of integration of social, economic and governance systems.

The amended NEMA environmental impact assessment (EIA) regulations were published on 18 December 2010 in Government Gazette No. 33306, Government Notice Regulation (GNR) 543, 544, 545 and 546.

The EIA Regulations provide three categories of listed activities which require environmental authorisation prior to construction:

- GNR.544 identifies activities that would require environmental authorisation in the form of a Basic Assessment (BA) process prior to the commencement of that activity. A BA activity is perceived to pose less potential impact than an EIA activity.
- GNR.545 identifies activities that would require environmental authorisation in the form of a Scoping and EIA process prior to the commencement of that activity.
- GNR.546 relates to identified activities that would require environmental authorisation prior to the commencement of that activity in specific identified geographical areas only.

The NEMA activities, potentially applicable to the proposed are listed below:

Table 7: NEMA Listed Activities

Listed Activity	Activity description	Relevance to the Project
GNR. 544 Activity 9 (i) (ii)	The construction of facilities or infrastructure exceeding 1000 metres in length for the bulk transportation of water, sewerage or storm water- • With an internal diameter of 0.36 metres or more; or • With a peak throughput of 120 litres per second or more, Excluding where: • Such facilities or infrastructure are for bulk transportation of water, sewerage or storm water or storm water drainage inside a road reserve; or Where such construction will occur within urban areas but further than 32 metres from a watercourse, measured from the edge of the watercourse.	The proposed slurry pipeline, which will be routed between the Waterval TSF's and the WLTR plant, will be approximately 11.5 km's in length thus exceeding the threshold length of 1 km stipulated in legislated listed activity.
GNR. 544 Activity 10	The construction of facilities or infrastructure for the transmission and distribution of electricity (i) outside urban areas or industrial complexes with a capacity of more than 33 kV but less than 275 kV; or (ii) inside urban areas or industrial complexes with a capacity of 275 kV or more.	Power lines may need to be relocated in order to bring power to a proposed pre-treatment facility.
GNR. 544	The construction of bridges where such construction occurs within a watercourse or within 32 me-	The proposed slurry pipeline will cross a river at two different points on route to

Listed Activity	Activity description	Relevance to the Project
Activity 11 (iii)	tres of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line.	the WLTR plant. The pipeline will cross the river / s by means of a bridge which will be constructed within 32 metres of the said watercourse.
GNR. 544 Activity 18	The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock or more than 5 cubic metres from watercourse.	The proposed pipeline may cross a watercourse. This will be investigated in the EIA process.
GNR. 544 Activity 22	The construction of a road, outside urban areas, ■ With a road reserve wider than 13.5 metres or, ■ Where no reserve exists where the road is wider than 8 metres.	The project may include the lay down of a road as a supporting infrastructure to the Pre-treatment plant and booster station.
GNR. 544 Activity 23	The transformation of undeveloped, vacant or derelict land to- ■ Residential, retail, commercial, recreational, industrial or institutional use, inside an urban area, and where the total area to be transformed is 5 hectares or more, but less than 20 hectares, or ■ Residential, retail, commercial, recreational, industrial or institutional use, outside an urban area, and where the total area to be transformed is bigger than 1 hectare but less than 20 hectares.	The mine is situated outside of an urban area. The project will involve the development of an area greater than 1 hectare.
GNR. 544 Activity 47	The widening of a road by more than 6 meters, or the lengthening of a road by more than 1 kilometre – ■ where the existing reserve is wider than 13.5 meters; or ■ where no reserve exists, where the existing road is wider than 8 meters – excluding widening or lengthening occurring inside urban areas.	Supporting roads which service the various existing facilities at RPM may require expansion / upgrading in order to cope with the increased traffic expected during the operational phase of the project.
GNR. 544 Activity 6	The construction of facilities or infrastructure for the bulk transportation of dangerous goods – ■ In gas form, outside an industrial complex, using pipelines, exceeding 1000 metres in length, with a throughput capacity of more than 700 tons per day; ■ In liquid form, outside an industrial complex, using pipelines, exceeding 1000 metres in length, with a throughput capacity of more than 50 cubic metres per day; or ■ In solid form, outside an industrial complex, using funiculars or conveyors with a throughput capacity of more than 50 tons per day.	The composition of the slurry which will be transferred by means of the proposed ± 12 km pipeline, may contain substances which are considered hazardous / dangerous according to classification in terms of SANS 10228. . The classification of the slurry as hazardous / dangerous will be investigated in the EIA Phase.

Therefore, a scoping and EIA process is required in order to obtain environmental authorisation for the re-processing of the Waterval TSF's project. The provincial department responsible for the authorisation will be the NWDEDECT and application for authorisation was submitted to this department on 21 August 2012 (**Appendix 1**).

5.4 National Water Act (No. 36 of 1998)

The National Water Act (NWA) provides for fundamental reformation of legislation relating to water resources and use. The preamble to the Act recognizes that the ultimate aim of water resource management is to achieve sustainable use of water for the benefit of all users and that the protection of the quality of water resources is necessary to ensure sustainability of the nation's water resources in the interests of all water users. The purpose of the Act is stated, in **Section 5** as, *inter alia*:

- Promoting the efficient, sustainable and beneficial use of water in the public interest;
- Facilitating social and economic development;
- Protecting aquatic and associated ecosystems and their biological diversity;
- Reducing and preventing pollution and degradation of water resources; and
- Meeting international obligations.

The Act presents strategies to facilitate sound management of water resources, provides for the protection of water resources, and regulates use of water by means of Catchment Management Agencies, Water User Associations, Advisory Committees and International Water Management.

As this Act is founded on the principle the government has overall responsibility for and authority over water resource management, including the equitable allocation and beneficial use of water in the public interest, an industry (including mines) can only be entitled to use water if the use is permissible under the NWA.

Specified water uses must be licensed unless it is listed in Schedule 1 (of the NWA), is an existing lawful use, is permissible under a general authorisation, or if a responsible authority waives the need for a license.

The following activities are considered relevant to the proposed re-processing of the Waterval TSF's project (refer to **Table 8**):

Table 8: NWA Listed Activities (NWA, 1998)

Legislation and Notice Number	Activity description	Relevance to the Project
NWA, Chapter 4: 21 (g)	Disposing of waste in a manner which may detrimentally impact on a water resource.	The proposed project involves the construction of a PCD which will contain the storm water which is collected from the pre-treatment facility at Waterval TSF storm water drainage system. The water is considered contaminated / dirty and could therefore have a detrimental impact on a water resource if released into the environment.
NWA, Chapter 4: 21 (c)	Impeding or diverting the flow of water in a watercourse.	The proposed project includes the installation of a pipeline between the Waterval TSF and the WLTR plant. The pipeline will cross a watercourse in 3 different locations. It should be noted that the pipeline will follow an existing compressed air pipeline route for which an IWUL exists.
NWA, Chapter 4: 21 (i)	Altering the banks of a water course.	The proposed project includes the installation of a pipeline between the Waterval TSF and the WLTR plant. The pipeline will

Legislation and Notice Number	Activity description	Relevance to the Project
		cross a watercourse in 3 different locations. It should be noted that the pipeline will follow an existing compressed air pipeline route for which an IWUL exists.

An IWUL in terms of the National Water Act (36 of 1998) was attained by RPM for all its existing water uses in March 2012, which includes existing river crossings and water storage. Consultation with the DWA will be conducted to determine if the existing IWUL can accommodate the inclusion of the proposed new slurry pipeline at existing licenced crossings. The process for amending the IWUL will be to update the existing Integrated Water and Waste Management Plan (IWWMP) for the RPM and submit this to the DWA for its consideration.

Relevant project activities requiring WULS are included in **Table 9**.

Table 9: Project Activities potentially requiring WULs

Activity	Activity description	Relevant NWA licence activity	Location (Google Earth co-ordinates) and Property information	Date of commissioning
Construction of Pollution Control Dam at Waterval TSFs	▪ The PCD is currently designed to have the capacity to contain 25000 m^3 of water (with an 800mm freeboard) and will be constructed in line with GNR.704 Regulations. ▪ Final capacity of the PCD will be determined in the EIA process; however, this will not exceed the aforementioned 40,000 m^3. ▪ The PCD adjacent to the Waterval pre-treatment plant will also assist with stormwater management onsite during high stormwater events.	▪ **NWA, Chapter 4: 21 (g)**	25° 39' 14.78" S 27° 18' 38.34" E Portion 19 Waterval 303 JQ	▪ Construction starts mid-2013 ▪ Commissioning mid-2014
Construction of Slurry and Return water Pipeline Section 1 - 2	▪ Pipeline alongside a wetland/floodplain area, adjacent to Klipgatspruit.	▪ **NWA, Chapter 4: 21 (c)** ▪ **NWA, Chapter 4: 21 (i)**	Point 1: 25° 39' 27.41" S 27° 19' 15.70" E Point 2: 25° 39' 50.26" S 27° 19' 24.94" E All on Remainder	▪ Construction starts mid-2013 ▪ Commissioning mid-2014

Activity	Activity description	Relevant NWA licence activity	Location (Google Earth co-ordinates) and Property information	Date of commissioning
			of Waterval 303 JQ	
Construction of Slurry and Return water Pipeline Section 3-4	▪ Pipeline runs alongside the floodplain of the Klipgatspruit and crosses the spruit near point 4. ▪ Crossing will be through existing storm water culverts under the road and railway line.	▪ **NWA, Chapter 4: 21 (c)** ▪ **NWA, Chapter 4: 21 (i)**	Point 3: 25° 39' 56.15" S 27° 19' 50.78" E Point 4: 25° 39' 55.80" S 27° 20' 06.19" E All on Portion 10 of Waterval 303 JQ	▪ Construction starts mid-2013 ▪ Commissioning mid-2014
Construction of Slurry and Return water Pipeline Section 4-5	▪ Northern most portion of this section runs adjacent to the floodplains of the Klipgatspruit.		Point 4: 25° 39' 56.15" S 27° 19' 50.78" E Portion 10 of Waterval 303 JQ Point 5: 25° 40' 16.54" S 27° 20' 02.95" E Portion 13 of Waterval 303 JQ	▪ Construction starts mid-2013 ▪ Commissioning mid-2014
Construction of Slurry and Return water Pipeline Section 6-7	Pipeline crosses the Klipgatspruit and flood plains along existing pipe bridge.	▪ **NWA, Chapter 4: 21 (c)** ▪ **NWA, Chapter 4: 21 (i)**	Point 6: 25° 40' 15.10" S 27° 20' 27.66" E On Portion 50 of Waterval 303 JQ Point 7: 25° 40' 08.67" S 27° 21' 16.85" E On Portion 15 of Waterval 303 JQ River crossing: 25° 40' 10.57" S 27° 21' 02.72" E On Portion 50 of Waterval 3	▪ Construction starts mid-2013 ▪ Commissioning mid-2014

Activity	Activity description	Relevant NWA licence activity	Location (Google Earth co-ordinates) and Property information	Date of commissioning
			03 JQ	
Construction of Slurry and Return water Pipeline Section 9-10	Pipeline crosses Klipgatspruit along existing pipe bridge at point 10. A booster station will be constructed that will assist with the transportation of slurry material from the Waterval TSF to the WLTR Plant. It has been proposed that the booster station be constructed south of the Siphumelele Shaft 1, approximately 8 km east of the Waterval pre-treatment plant. The booster station will house a water storage facility (500 m^3), a sump for slurry spillage (± 80 m^3) and booster pumps that will feed into an overland pipeline to the WLTR Plant. **Figure 10** shows an example of overland pipelines similar to those which are proposed.	▪ **NWA, Chapter 4: 21 (c)** ▪ **NWA, Chapter 4: 21 (i)**	Point 9: 25° 40' 01.36" S 27° 22' 13.77" E Klipfontein 300 JQ Point 10: 25° 40' 00.53" S 27° 22' 29.51" E Klipfontein 300 JQ River crossing: 25° 40' 00.53" S 27° 22' 29.51" E Klipfontein 300 JQ Booster Station: 25° 40' 01.87" S 27° 22' 21.87" E Klipfontein 300 JQ	▪ Construction starts mid-2013 ▪ Commissioning mid-2014
Construction of Slurry and Return water Pipeline Section 10-11	Pipeline crosses Klipgatspruit along existing pipe bridge at point 10.	▪ **NWA, Chapter 4: 21 (c)** ▪ **NWA, Chapter 4: 21 (i)**	Point 10: 25° 40' 00.53" S 27° 22' 29.51" E Klipfontein 300 JQ Point 11: 25° 40' 46.34" S 27° 23' 01.07" E Klipfontein 300 JQ River crossing: 25° 40' 00.53" S 27° 22' 29.51" E Klipfontein 300 JQ	▪ Construction starts mid-2013 ▪ Commissioning mid-2014

5.5 Mine Health and Safety Act (No. 29 of 1996)

The Mine Health and Safety Act (No. 29 of 1996) as amended in 2008 aims to provide for protection of the health and safety of employees and other persons at mines.

The proposed infrastructure will be located within the RPM mine lease area and, as such, RPM need to ensure that this Act and subsequent amendment regulations are adhered to on site by employees, contractors, sub-contractors and visiting personnel. This is especially pertinent during the construction phase.

5.6 National Environmental Management Biodiversity Act (No. 10 of 2004)

In line with the Convention on Biological Diversity (CBD), the Act aims to legally provide for biodiversity conservation, sustainable use and equitable access and benefit sharing. The Act establishes the South African National Biodiversity Institute (SANBI). NEM: BA creates a basic legal framework for the formation of a national biodiversity strategy and action plan and the identification of biodiversity hotspots and bio-regions which will then be given legal recognition. It imposes obligations on landowners (state or private) governing alien invasive species as well as regulates the introduction of genetically modified organisms. Furthermore, the Act serves to regulate bio-prospecting, making provision for communities to share the profits of any exploitation of natural materials involving indigenous knowledge.

During the Scoping and EIA process biodiversity hotspots and bio-regions will be identified to determine the potential effect which the project may have on the receiving environment. The establishment of alien invasive species on the project site will be governed by the Act. The Act ensures that provision is made by the site developer to remove any aliens which have been introduced to the site or are present on the site.

5.7 National Environmental Management Air Quality Act (No. 39 of 2004)

The new National Environmental Management: Air Quality Act 39 of 2004 (NEM:AQA), which repeals the Atmospheric Pollution Prevention Act of 1965, came into effect on 11 September 2005, with the promulgation of regulations in terms of certain sections resulting in the APPA being repealed entirely on 1 April 2010. Key features of the current legislation include:

- A decentralisation of air quality management responsibilities;
- The identification and quantification of significant emission sources that then need to be addressed;
- The development of ambient air quality targets as goals for driving emission reductions;
- The use of source-based (command-and-control) measures in addition to alternative measures, including market incentives and disincentives, voluntary programmes, and education and awareness;
- The promotion of cost-optimized mitigation and management measures;
- Air quality management planning by authorities, and emission reduction and management planning by sources; and
- Access to information and public consultation.

The NEM:AQA introduced a management system based on ambient air quality standards and corresponding emission limits to achieve them. Two significant regulations stemming from NEM:AQA have been promulgated recently, which are:

- **GNR 1210** on 24 December 2009 (Government Gazette 32816) National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) National Ambient Air Quality Standards.
- **GNR 248** on 31 June 2010 (Government Gazette 33064) National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) List of Activities which result in Atmospheric Emissions which have or may

have a significant detrimental effect on the environment, including health, social conditions, economic conditions, ecological conditions or cultural heritage.

The project involves the installation of 4 IsaMills™ at the WLTR plant. The role of the IsaMills™ is to grind the reclaimed material obtained from the Waterval TSF to a finer grade. The finer grade material will be transferred to the smelter and the material which cannot be processed further will be transferred to the Hoedspruit TSF. The material, being a finer grade in comparison to the current output of the WLTR Plant, is more easily disturbed and transferred into the atmosphere leading to an overall increase of dust / particulate matter. An air quality specialist study is being conducted as a component of the project in order to investigate the cumulative impacts to the regional air quality with respect to the above statute, however no NEM: AQA listed activities have been identified at this point.

5.8 National Environmental Management Waste Act (No. 59 of 2008)

The National Environmental Management: Waste Act (No. 59 of 2009) (NEMWA) serves to reform the law regulating waste management in order to protect human health and the environment. This is managed by providing reasonable measures for the prevention of pollution and ecological degradation. The NEMWA aims to secure ecologically sustainable development while promoting justifiable economic and social development. The NEMWA provides national norms and standards for regulating the management of waste by all spheres of government, for specific waste management measures and for matters incidental thereto.

Furthermore, the Act protects the health, well-being and the environment by:

- Providing reasonable measures for minimisation of consumption of a natural resource;
- Minimising general waste;
- Reducing, re-using, recycling and recovering waste;
- Safely treating or disposing waste;
- Preventing pollution and ecological degradation; and
- Securing ecological sustainable development.

The Act also promotes:

- Economic and sustainable development;
- Effective delivery of waste services;
- Remediation of contaminated land; and
- Integrated waste management.

No activities under Category A & B of the NEM: WA GNR 718 have been identified thus far. RPM should however comply with the NEM:WA in terms of the NEM: WA objectives, the waste hierarchy and the general measures which are promoted by the Act.

5.9 National Heritage Resources Act (No. 25 of 1999)

The National Heritage Resources Act (No. 25 of 1999) provides for an integrated and interactive system for the management of the national heritage resources and empowers civil society to nurture and conserve their heritage resources so that they may be bequeathed to future generations. Furthermore, the Act established the South African Heritage Resources Agency (SAHRA) in 1999. SAHRA is tasked with protecting heritage resources of national significance. Heritage sites include any subject of historical and / or cultural value. During the Scoping and EIA process provision should be made to assess the site proposed for development to ensure the site is not considered valuable by the SAHRA or any other influential party, such as a governmental department. During the EMPR conducted in 2002 [ref no. RNW(KL) 6/2/2/3164], the mine lease area associated with the proposed project was assessed in detail.

5.10 Conservation of Agricultural Resources Act (No. 43 of 1983)

The Conservation of Agricultural Resources Act (No. 43 of 1983) (CARA) includes the use and protection of land, soil, wetlands and vegetation and the control of weeds and invader plants. This is the only legislation that is directly aimed at conservation of wetlands in agriculture.

In 1984, regulations were passed in terms of the CARA regulations declaring about 50 species "weeds" or "invader plants". On 30 March 2001 the Minister of Agriculture promulgated an amendment to these regulations. This amendment now contains a comprehensive list of species that are declared weeds and invader plants dividing them into three categories. These categories are as follows:

- Category 1: Declared weeds that are prohibited on any land or water surface in South Africa. These species must be controlled, or eradicated where possible.
- Category 2: Declared invader species that are only allowed in demarcated areas under controlled conditions and prohibited within 30 m of the 1:50 year floodline of any watercourse or wetland.
- Category 3: Declared invader species that may remain, but must be prevented from spreading. No further planting of these species are allowed.

In terms of the amendments to the regulations under the CARA, landowners are legally responsible for the control of alien species on their properties. Various Acts administered by the DEA and DWA, as well as other laws (including local by-laws), spell out the fines, terms of imprisonment and other penalties for contravening the law. Although no fines have yet been placed against landowners who do not remove invasive species, the authorities may clear their land of invasive alien plants and other alien species entirely at the landowners cost and risk.

Specific management measures for the conservation of agricultural resources will be included in the EMPR although the tailings storage area will be rehabilitated upon closure, to a predefined state as per the closure plan which is required to be updated on a regular basis.

5.11 Hazardous Substances Act (No. 15 of 1979)

The object of the Act is *inter alia* to 'provide for the control of substances which may cause injury or ill health to or death of human beings by reason of their toxic, corrosive, irritant, strongly sensitising or flammable nature or the generation of pressure thereby in certain circumstances; for the control of electronic products; for the division of such substances or products into groups in relation to the degree of danger; for the prohibition and control of such substances.'

In terms of the Act, substances are divided into schedules, based on their relative degree of toxicity, and the Act provides for the control of importation, manufacture, sale, use, operation, application, modification, disposal and dumping of substances in each schedule.

Dangerous substances contained on-site during the construction phase of the proposed project will need to be managed in accordance with the Act and material safety data sheets (MSDS) will need to accompany all dangerous goods (hydrocarbon fuels, cleaning chemicals, paints, etc.).

5.12 Noise Regulations

5.12.1 South African Bureau of Standards

With regards to the South African Bureau of Standards (SABS) there are South African National Standards (SANS) that may be relevant to the proposed project. These are:

- SANS 1929:2009 – Ambient air quality (limits for common pollutants);
- SANS 10103:2008 –The measurement and rating of environmental noise with respect to annoyance and to speech communication; and

SANS10328: 2008 – Methods for environmental noise impact assessments.

The activities associated with the proposed development will be assessed in terms of their compliance with relevant standards in order to determine if any significant noise impacts may be anticipated. Mitigation measures to ensure compliance will be required in instances of exceedance of the relevant standards.

5.13 Roads Ordinance (No. 22 of 1957)

The Roads Ordinance 22 of 1957 is still active in the Northwest province. The ordinance provides the detail regarding changes to provincial and district roads. Section 34 of the act deals with prohibitions of encroachments, alterations or obstructions and states:

(1) No person shall, unless authorised in terms of this Ordinance or any other law- (a) encroach on any public road by erecting or making any building, structure, fence, furrow, channel, ditch or other obstacle or by laying a pipe line, wire or cable on, over or under such road.

Section 35 allows the Provincial department of roads to allow such an encroachment on payment of a fee and application in writing. The proposed slurry pipeline will cross a provincial road in several places and will be regarded as an encroachment, and will therefore require an authorisation from the Northwest Provincial Roads Department.

5.14 Promotion of Access to Information Act (No. 2 of 2000)

The Promotion of Access to Information Act (No. 2 of 2000) (PAIA) recognises that everyone has a right of access to any information held by the state and by another person when that information is required to exercise or protect any right. The purpose of the Act is to promote transparency and accountability in public and private bodies and to promote a society in which people have access to information that enables them to exercise and protect their right.

The EIA process to be undertaken, and particularly the stakeholder consultation component, is aligned with the PAIA in the sense that all registered stakeholders will be provided a fair opportunity to review and comment on any reports submitted to the authorising authority for decision making.

5.15 Municipal By-laws

In addition to national legislation, some of South Africa's nine provinces have their own provincial biodiversity legislation, as nature conservation is a concurrent function of national and provincial government in terms of the Constitution of South Africa.

5.15.1 Rustenburg Local Municipality: Air Pollution By-laws (No. 271 of 2008)

In terms of Section 46 of the NEMA, the Minister may make model environmental management by-laws aimed at establishing measures for the management of environmental impacts of any development within the jurisdiction of a municipality, which may be adopted by a municipality as municipal by-laws. The generic air pollution control by-law has been drafted in accordance with this enabling provision of the NEMA.

The objectives of the by-law include the following:

- To give effect to the right contained in Section 24 of the Constitution by regulating air pollution within the area of the municipality's jurisdiction ;
- To provide, in conjunction with any other applicable law, an effective legal and administrative framework, within which the council can manage and regulate activities that have the potential to adversely impact the environment and public health; and

To ensure that air pollution is avoided, or where it cannot be altogether avoided, mitigated or minimised.

5.15.2 Rustenburg Local Municipality: By-laws relating to the Management and Control of Informal Settlements within the area of jurisdiction of the Municipality (No. 127 of 2008)

The by-law seeks to ensure the correct management and mitigation of the occurrence of informal settlements in the RLM. The by-law promotes the following, but is not limited to:

- Regular surveys to determine the number and extent of informal settlements;
- The monitoring and control of informal settlements in order to prevent unauthorised establishment; and
- The understanding of the local communities' perceptions on illegal settlement.

5.15.3 Rustenburg Local Municipality: Waste Management By-Laws (No. 79 of 2011)

The RLM: Waste Management By-Laws serves to protect human health and the environment by managing the production, transportation, disposal and general management of waste produced within the RLM borders. This is managed by providing reasonable measures for the prevention of pollution and ecological degradation.

The objectives of the by-law read as follows:

- To provide for effective delivery of the municipal service;
- To protect the environment by providing reasonable measures for-
  - Ensuring that waste management, including the storage, collection, transportation, treatment and disposal of waste, is undertaken in a comprehensive and responsible manner;
  - Minimising the consumption of natural resources;
  - The minimising of the generation of waste;
  - The reuse and recycling of waste;
  - The safe disposal of waste; and
  - Achieving integrated waste planning.
- Generally giving effect to section 24 of the constitution in order to secure an environment that is not harmful to the health and well-being of people.

6 Scoping Process

6.1 Introduction

Environmental authorisation is required prior to the commencement of the proposed project in accordance with the NEMA and MPRDA. A full scoping and EIA will be undertaken for the project and will be compiled in accordance with both the requirements of the NEMA EIA Regulations of 2010 and the MPRDA.

In accordance with the requirements of the MPRDA and the NEMA, a scoping report must be submitted to the provincial office of the DMR and the NW DEDECT, in which the proposed project is situated. The purpose of the scoping report is to identify the baseline environmental and socio-economic conditions of the proposed project site, provide an opportunity for the public to comment on the proposed project, and assess the potential impacts / risks associated with the proposed WLTR Project.

The environmental scoping phase was undertaken in line with the requirements of the NEMA EIA Regulations as well as the MPRDA. The objectives of the scoping phase are to:

- Ensure that the process is open and involves the applicant, authorities and stakeholders;
- Provide details of the EAP who compiled the report and the relevant experience to carry out scoping procedures;
- Describe the proposed activity;
- Identify feasible alternatives that can be selected for further assessment;
- Identify and describe the environment that may be affected by the activity and the manner in which the physical, biological, socio-economic and cultural aspects of the environment may be affected;
- Description of the environmental issues and potential impacts, including cumulative impacts;
- Provide information on the methodology that will be adopted in assessing the potential impacts during the EIA process;
- Provide details of the stakeholder engagement process followed;
- Comply with the relevant environmental legislation; and
- Provide a plan of study for the EIA.

An important part of any scoping phase is the stakeholder engagement process. The stakeholder engagement was initiated from the onset of the project to ensure that all stakeholders were adequately and effectively consulted, in order to:

- Inform, raise awareness, educate and increase understanding of a broad range of stakeholders about the project, affected environment and the environmental process to be followed;
- Establish lines of communication between authorities, stakeholders and the project team;
- Provide ample opportunity for all parties to exchange information and express their views and concerns;
- Obtain contributions of stakeholders and ensure that all issues, concerns and queries raised were fully documented; and
- Identify all the significant issues pertaining to the project.

The following sections outline the tasks that have been undertaken as part of the scoping phase.

6.2 Methodology Applied to the Scoping Phase

The following activities are undertaken as part of the scoping phase and subsequent stakeholder engagement:

- Submission of an application form to NWDEDECT on 21 August 2012;
- Letter of notification to the DMR: **Reference Number: RNW(KL) 6/2/2/3164** (13 September 2012);
- Notification of authorities and stakeholders of the proposed project through a transparent and comprehensive stakeholder consultation process (29 November 2012)
- A public meeting will be held in order to present the proposed project to the public and for them to raise concerns or queries relating to the WLTR project. The public meeting will be held at the Tshukudu High School on Wednesday the 16th of January 2013 from 16:00pm to 17:30pm. Members of the public wishing to attend can contact WSP for directions to the venues:

  Invitations to the meeting will be sent to already registered stakeholders; however should any unregistered stakeholders wish to attend a public meeting, or be registered as an I&AP, they can contact Jared O'Brien from WSP on the contact details below:

  Tel: 011 361 1396

  Fax: 086 505 3939

  Email: Jared.OBrien@wspgroup.co.za
- Focus group meetings with commenting authorities and local leaders (such as the RLM, Bojanala District Municipality, DWA, etc.) will be conducted in order to present the proposed project to these stakeholders and for them to raise concerns or queries relating to the WLTR project. A notification meeting with the Royal Bafokeng Nation has been undertaken to date, of which the comments received and the responses issued have been tabulated in the Issues Trail contained within **Appendix 4.6** of this report.
- Recording of issues and compilation of an issues trail and identification of potential environmental impacts;
- Compilation of a draft scoping report, including the stakeholder engagement process and plan of study for the EIA;
- Placement of the Scoping Report for public and state department review for a period of 40 days (29 November 2012 to 27 January 2013); and
- Finalisation and submission of final scoping report to DMR and NWDEDECT.

6.3 Stakeholder Engagement Plan

The stakeholder engagement process is a requirement of any environmental authorisation process in terms of NEMA and MPRDA and ensures that all stakeholders (interested and / or affected parties, as well as relevant government authorities) are consulted and involved. In addition to this, AAP have committed themselves to build robust and healthy stakeholder relations grounded in value-based engagement through the development of the *RPM - Community Engagement Plan* (CEP, 2011) and a *Socio-economic Assessment Toolbox* (SEAT, 2009). Thus the Stakeholder Engagement Plan (SEP) for the current proposed project incorporates both legislative and RPM-CEP and SEAT objectives in order to:

- Identify meaningful stakeholder groupings and identify relevant stakeholders within these groupings;
- Notify identified stakeholders of the proposed project in a manner appropriate to communication mechanisms available to each grouping and in the languages most widely spoken within groupings ;
- Notify identified stakeholders in a language appropriate to the stakeholders that will be engaged;
- Provide project information in a manner that is tailor made to the stakeholder groupings that have been identified; and
- Assimilate issues raised on the proposed project into the assessment of social and environmental impacts that will be conducted as part of the EIA and EMPR process.

The SEP ensures that all stakeholders have been engaged meaningfully and reasonably and have been afforded with an opportunity to raise their comments as part of an open and transparent process.

6.3.1 Stakeholder Identification

In order to identify stakeholders the following groupings were identified based on requirements of NEMA and the MPRDA, as well as stakeholder analyses conducted in the RPM-CEP and SEAT reports:

- National and provincial government (organs of state with jurisdiction over any proposed activity);
- Local government;
- Landowners;
- Local leadership (including ward councillors) and traditional authorities;
- Potentially affected communities;
- Non-government Organisations; and
- Organised business.

Existing WSP and RPM databases have been used to develop a project specific database (**Appendix 4.1**) representative of the above groupings for initial stakeholder notification. The project stakeholder database is however a dynamic tool and will be updated throughout the process to included additional stakeholders that may indicate their interest in the proposed project.

6.3.2 Stakeholder Notification

6.3.2.1 Site Notices

The NEMA EIA Regulations require that a site notice be fixed at a place conspicuous to the public at the boundary or on the fence of the site where the activity to which the application relates is to be undertaken and on any alternative sites. Site notices (English and Tswana) will be placed at the following locations in and around the project area:

- Existing entrance / access road to the Waterval TSF;
- Proposed entrance / access road to the Waterval TSF;
- WLTR Plant entrance / access road;
- RPM Sports and Recreation Club;
- Thlabane Public Library (coordinates: 25° 38’ 20.95”S 27° 12’ 55.74”E);
- Rustenburg Local Municipality (coordinates : 25° 40’ 21.48”S 27° 14’ 35.02”E);
- Mfidikwe Primary School (coordinates : 25° 39’ 48.24”S 27° 20’ 31.75”E);
- Platinum Health Medical Centre (coordinates: 25° 41’ 54.47”S 27° 21’ 21.99”E);
- Traditional Authority Offices;
- Additional intersections that will be visible to the public;
- Locations along the pipeline route that will be visible to the local communities; and
- Public community locations, etc.

The purpose of site notices is to notify the public of the project and to invite the public to register as stakeholders and inform the public of the public meeting. Refer to **Appendix 4.2** for a copy of the site notice.

6.3.2.2 Background Information Document

The purpose of the background information document (BID) is to provide background information on the proposed project, outlining the environmental process, notifying stakeholders of the date and venue for the

public meeting and providing an opportunity for registration of other stakeholders. A copy of the BID is contained in **Appendix 4.3**.

A letter of invitation and accompanying BIDs were emailed, faxed and posted to existing stakeholders where these contact numbers where available. This mechanism of notification is suitable for all groupings, except for the local communities, many of whom do not have access to these forms of communication. In order to ensure an encompassing notification, sms notifications were sent to stakeholders in local communities for which cell phone numbers were available and copies of the BID are being distributed as hand-outs to the local communities by WSP and the local ward councillors and traditional leaders as well as left at the following locations:

- Fraser-Alexander site office (coordinates : 25°40' 11.85"S 27° 19' 08.65"E);
- WLTR Plant entrance (coordinates : 25° 41' 24.16"S 27° 23' 47.53"E);
- Thalbane Public Library (coordinates: 25° 38' 20.95"S 27° 12' 55.74"E);
- Rustenburg Local Municipality (coordinates : 25° 40' 21.48"S 27° 14' 35.02"E);
- Mfidikwe Primary School (coordinates : 25° 39' 48.24"S 27° 20' 31.75"E);
- Thekwane Thlage Primary School (coordinates: 25° 39' 29.15"S 27° 22' 00.81"E); and
- RPM Sports and Recreation Club (coordinates: 25° 42' 01.37"S 27° 21' 22.21"E).

6.3.2.3 Newspaper Advertisement

The NEMA EIA Regulations require that a newspaper advertisement be placed in either a local newspaper or a Government Gazette. Should the project have a potential impact that extends beyond the boundaries of the metropolitan or local municipality, the project should be advertised within at least one provincial or national newspaper. For the proposed project WSP is required to place an advertisement in a local newspaper or a Government Gazette. To ensure that the stakeholder consultation process is comprehensive, an advertisement (English and Tswana) was placed in a provincial newspaper and a local newspaper. The proposed project was therefore advertised through the press in the following newspapers:

- A provincial newspaper, namely the Daily Sun on 29 November 2012; and
- A local newspaper, namely the Rustenburg Herald on 29 November 2012.

Refer to **Appendix 4.4** for a copy of the newspaper advertisements and proof of publication.

6.3.3 Stakeholder Meetings

Stakeholder meetings will be held to outline the details of the project and provide an opportunity for stakeholders to raise issues, concerns and queries related to the proposed project. The meetings will also establish the lines of communication between the stakeholders and the project team.

The following three stakeholder meetings will be conducted in order to incorporate the above-mentioned groupings:

- Authorities meetings – local and provincial government;
- Local leadership – ward councillors, traditional authorities; and
- Local community – potentially affected communities and receptors (such and schools, clinics etc.) within the communities, local labour.

All meetings will be facilitated by WSPs EIA team and will be attended by the AAP project representatives. The engineers responsible for project management and design (TWP) will contribute technical detail and present the specific activities that will be undertaken. For the local community meeting a facilitator who can translate (from English into Tswana) information presented, as well as comments coming from the stakeholders, will also attend. Invitations to these meetings will be sent to the relevant groupings (**Appendix 4.5**).

6.3.4 Public Review

The draft scoping report will be placed on public review for a period of 40 days from 29 November 2012 to 27 January 2013, at the following venues:

- Thekwane Thlage Primary School (coordinates : 25° 39' 29.15"S 27° 22' 00.81"E);
- Mfidikwe Primary School (coordinates : 25° 39' 48.24"S 27° 20' 31.75"E);
- UG2 Concentrator Reception (coordinates : 25°40' 11.85"S 27° 19' 08.65"E);
- Thlabane Public Library (coordinates: 25° 38' 20.95"S 27° 12' 55.74"E);
- WLTR Plant entrance (coordinates : 25° 41' 24.16"S 27° 23' 47.53"E);
- Rustenburg Local Municipality (coordinates : 25° 40' 21.48"S 27° 14' 35.02"E); and
- WSP Environment and Energy website (www.wspenvironmental.co.za).

All registered stakeholders and commenting state departments will be notified of the public review period as well as the locations of the draft scoping reports via fax and email, post, sms and hand-outs.

The abovementioned plan, for notification and provision of reports, will also be utilised for the review of the EIR and EMPR once the EIA phase has been concluded in the future.

6.3.5 Issues Trail

All concerns, comments, viewpoints and questions (collectively referred to as 'issues') will be documented and responded to adequately in the Issues Trail. The Issues Trail records the following, as listed below, and is provided in **Appendix 4.6**:

- List of all issues raised;
- Record of who raised the issues;
- Record of where the issues were raised; and
- Response to the issues (given by the project team).

6.3.6 Summary of Issues

Comments from one stakeholder, the RBN, have been received to date and are summarised below. Comments received have been responded to in the issues trail:

- RBN (land owners of a portion of the proposed project area) indicated that lease agreements between AAP and the RBN need to be formalised and the RBN will oppose the project until this is done.

7 Potential Environmental Impacts

7.1 Introduction

The over-arching objective of the Scoping Phase is to identify record and describe the *potential* environmental impacts associated with the proposed project. This enables the specialist studies to be clearly focused on aspects of significant concern. It also provides a framework for the assessment of the impacts that the proposed project will have on the environment, and of the impacts the environment will have on the proposed project. Based on inputs from the project team, stakeholders, I&APs and specialists the environmental (biophysical and social) impacts in Table 10 and **Table 11** have been identified as potentially associated with the proposed development and will be investigated during the EIA phase of the process.

7.2 Potential Biophysical Environmental Impacts

Table 10: Potential environmental impacts potentially associated with the proposed project

Environmental Aspect	Potential Impact	Proposed method of investigation
Soils, Land Use and Land Capability	Loss of grazing capacity along pipeline route	Assessment of significance in the EIA
	Loss in agricultural potential along pipeline	
	Obstacles to movement of people and livestock due to overland pipeline	
	Potential for spills of fuels and other chemicals during construction and operation	
	Pipeline leaks during operation	
Biodiversity	Loss of terrestrial habitat	Aquatic Ecology Assessment and assessment of significance in the EIA
	Loss of aquatic / wetland habitat and habitat for bird species	
	Disturbance and displacement of fauna / avifaunal species	
	Faunal interaction with structures, servitudes and personnel	
	Impact on surrounding habitat and species	
	Increase in environmental degradation	
	Introduction / spread of alien species	
	Loss of species diversity	
Surface and Groundwater	Soil erosion from changes in surface water flow due to construction of infrastructure	Study to update existing surface water information and assessment of significance in the EIA
	Surface water pollution due to spills of fuels or chemicals during construction and operation	

Environmental Aspect	Potential Impact	Proposed method of investigation
	Removal of vegetation on the TSFs prior to reclamation may increase surface water runoff as well as the entrainment of tailings materials into the surface water and final deposition and sedimentation of the Klipgat Return Water Dam.	
	Positive impact of the reduction of tailings volume due to reprocessing thereby reducing the potential impacts / risks to ground water at final mine closure in the future.	
Air Quality	Particulate matter (dust) impacts from the Waterval TSF during construction phase due to removal of vegetation on the TSF prior to reclamation.	Air Quality Impact Assessment
	Particulate matter from the Hoedspruit TSF during operation, where the tailings from the WLTR are deposited	
Traffic	Construction vehicles using the existing road networks to access the proposed site and pipeline route	Traffic Impact Assessment
	Increase in the number of vehicles on the existing networks during operation	
	Loss of significant cultural / heritage resources	

7.3 Potential Socio-economic Impacts

Table 11: Socio-Economic and Cultural / Heritage Impacts potentially associated with the proposed project

Environmental Aspect	Potential Impact	Proposed method of investigation
Visual	Visual impact associated with construction vehicles and activities on site	Assessment of significance in the EIA
	Impact of the overland pipeline, pre-treatment plant and pollution control dams.	
	Should an increase to the approved height of the Hoedspruit TSF be required, there may be an associated visual impact.	
Noise	Noise impact during construction of the pipeline, pre-treatment plant, PCD and booster station.	Project will be considered in terms of noise standards applicable to mine lease area and rural / residential areas and assessment of significance in the EIA
	Noise from Isa Mills	
Safety	Safety of employees at reclamation site.	Assessment of significance in the EIA
	Safety of employees and public along pipeline route during construction	

Environmental Aspect	Potential Impact	Proposed method of investigation
	Road Safety: Increase in construction trucks / heavy vehicles on public roads	
Culture and Heritage	Impacts on previously unknown heritage / cultural / archaeological resources that may be un-earthed during construction	Review of existing heritage / cultural information and assessment of significance in the EIA
Socio-Economic	Job creation	Social Impact Assessment
	Expansion of local skills	
	Local procurement opportunities	
	Economic development	
	Impact on grazing activities	
	Security / safety risks of the public	
	Noise intrusion	
	Dust intrusion	
	Light intrusion	
	Increased potential for fires	
	Influx of people resulting in increase in informal settlements and additional pressure on existing facilities and resources.	
	Cracking of houses due to vibrations during construction activities such as ground compaction.	
	Restriction of access to facilities and resources such as grave yard, grazing land, places of work etc.	

7.4 Potential Cumulative Impacts

Cumulative impacts are regarded as the incremental and combined effects of human activity that pose a significant threat to the environment. Cumulative impacts accrue over time, from one or more sources, and can result in the degradation of valuable resources. Potential cumulative impacts have been identified and are presented in **Table 12**.

Table 12: Cumulative Impacts potentially associated with the proposed project

Aspect	Impacts	Cause
Climate	Release of greenhouse gas emissions	▪ Land based vehicle activity ▪ Increased electricity use
Air quality	Degradation of air quality	▪ Dust pollution from tailings
Hydrology	Surface water pollution Aquatic systems (ecosystem functioning)	▪ Soil erosion ▪ Soil contamination by chemicals and hydrocarbons
Geohydrology	Groundwater pollution	▪ Groundwater contamination from tailings storage facility
Socio-Economic	Safety Aesthetics	▪ Increases to existing activities in the area (movement of vehicles) ▪ Adding to the already built up nature of

Aspect	Impacts	Cause
		the environment
Socio-Economic	Regional economic benefit	■ Generation of new employment

8 Plan of Study for the Environmental Impact Assessment

8.1 Introduction

The Plan of Study for the EIA is a requirement of the EIA / EMP process. The purpose of the Plan of Study for the EIA is to detail the approach that the EAP will take towards the EIA / EMP process, which will be approved or authorised by the DMR (as an EMPR amendment document) and the NW DEDECT (as an (EIR)).

This process will be undertaken in accordance with the requirements of the MPRDA and the NEMA. This process is detailed in the sections below, as the following components:

- Tasks to be undertaken as part of the EIA / EMPR process;
- Specialist studies;
- Authority consultation;
- Proposed methodology to assess the environmental impacts and alternatives; and
- On-going stakeholder engagement.

8.2 Tasks to be undertaken as part of the EIA / EMPR Process

The following will be undertaken as part of the EIA / EMPR process.

8.2.1 Purpose of the Draft EIR and EMPR

The purpose of the EIR and draft EMPR is to provide / determine:

- An assessment of the environments likely to be affected by the proposed project;
- An assessment of the nature, extent, duration, probability and significance of the identified potential environmental, social and cultural impacts of the proposed project;
- A comparative assessment of the identified land use and development alternatives and their potential environmental, social and cultural impacts;
- The appropriate mitigation measures for each significant impact of the proposed project;
- Details of the engagement process of stakeholders followed during the course of the assessment and an indication of how the issues raised have been addressed;
- Identification of knowledge gaps and reporting on the adequacy of predictive methods, underlying assumptions and uncertainties encountered in compiling the required information;
- A description of the arrangements for monitoring and management of environmental impacts; and
- Inclusion of technical and supporting information as appendices, if available.

The following will be undertaken as part of the EIA and EMPR process.

8.2.2 Project Description

A detailed project and location description will be developed and completed for inclusion in the EIR. The project description will go on to include a description of the motivation and desirability of the project.

8.2.3 Specialist Studies

The undertaking of further investigations will be required during the EIA phase in order to address the issues raised and identified during the scoping phase. Cognisance will be taken regarding findings of the specialist studies and recommendations will be included into the EIR and EMPR documents. Five specialist studies have been identified to date, which include, but may not be limited to the following:

8.2.3.1 Traffic Impact Assessment

It has been noted that traffic entering the Waterval TSF and the pre-treatment plant area will be ± 12 light vehicles per day during the operational stage of the project. Furthermore, estimated 7-8 light motor vehicles will access the booster station per day during the operational phase of the project.

The numbers of vehicles which will be utilising the municipal roads as well as RPM roads during the construction phase of the proposed project will be determined in the EIA Phase. The exact values expected will be portrayed within the EIR following the undertaking of the Traffic Impact Assessment. The methodology to be undertaken for the Traffic Impact Assessment includes, but is not limited to the following:

- A site visit to observe current travel patterns and to gain an understanding of the project area;
- Liaison with the professional team members to extract relevant information to be incorporated into the study;
- A meeting with local Authority to discuss the traffic study methodology , components and aspects;
- Traffic counts will be undertaken at identified relevant intersections;
- The undertaking of a traffic study which will include:
    - A description of proposed development;
    - Comments on the existing road network;
    - Expected traffic to be generated as a result of the project;
    - Capacity analysis at access points and relevant intersections which will be impacted upon;
    - An assessment of the public transport system; and
    - The preparation of a study report which includes the findings, the conclusions and the recommendations of the study.

8.2.3.2 Air Quality Impact Assessment

Air Quality impacts have been identified as one of the potentially significant environmental aspects of reclamation / re-processing activities. In order to assess these impacts, an Air Quality Impact Assessment is required. During the environmental authorisation process conducted in 2002 in the form of an EMPR such an assessment was compiled which also included an Air Quality Management Plan. The aim of this study is to assess the change in Air Quality related impacts as a result of project, compared to the original assessments conducted as part of the EMPR in 2002, which excluded dust from the tailings facilities and the use of the IsaMills™. This will be done by baseline environmental characterisation, establishing an updated emissions inventory, applying atmospheric dispersion modelling and assessing the impacts, as detailed below (to be undertaken during the EIA phase):

- Baseline Environment Characterisation

In order to conduct such an assessment WSP will investigate the current baseline Air Quality conditions as contained in the original Air Quality Impact Assessment and Air Quality Management Plan of the 2002 EMPR. The Air Quality conditions relating to particulate matter and dust will be compared to the relevant standards as found under Section 9 of NEM:AQA and in GNR. 1210 of NEM:AQA, for particulate matter, and SANS 1929:2005 and Government Gazette, Notice 309 and 2011 for dust fallout.

- Updated Emissions Inventory

In order to account for the potential impacts as a result of the use of the IsaMills™, the existing emissions inventory will be updated to quantify the emissions of both particulate matter and dust from the project components. Calculation of the emission mass, by source, time period, and pollutant will be the undertaken. These variables are calculated by using individual emission source information with their associated emission factors, and the respective operational parameters over a determined period of time.

- Atmospheric Dispersion Modelling and Impact Assessment

Dispersion modelling will be undertaken using either AERMOD or ADMS 4 programme. Once the site situation is completely understood, the appropriate model will be utilized. These are new generation air dispersion models designed for short-range dispersion of airborne pollutants in steady state plumes. AERMOD and ADMS incorporate air dispersion based on boundary layer turbulence structure and scaling, including treatment of both surface and elevated sources, and both simple and complex terrain. The AERMOD and ADMS systems both use hourly sequential meteorological files with pre-processors to generate flow and stability regimes for each hour that cumulatively offer long-term ambient concentrations whilst also capturing short-term peaks. Maps of plume spread with key isopleths are used for visual interpretation whilst statistical output can be compared directly with the latest national and international ambient air quality standards for compliance testing against regulated benchmarks. Other site specific data such as geographic coordinates and a full set of hourly-sequential meteorological data will be integrated into the model base.

The model will be programmed to compute ambient ground-level concentrations of the pollutants identified, based on both long-term (annual / chronic) and short-term (worst-case / acute) scenarios. Model scenarios will be for cumulative impacts (i.e. including background concentrations, nearby sources and proposed sources) such that statistical output can be compared with applicable ambient air quality standards for compliance assessment. Furthermore, the Air Quality Management Plan (AQMP) will be updated to reflect the Air Quality impacts.

8.2.3.3 Aquatic Ecological Impact Assessment;

A detailed aquatic ecological assessment will be undertaken in order to determine the potential impact on the aquatic ecosystem of the Klipgatspruit. The proposed pipeline will cross the Klipgatspruit at 3 separate locations. The study will include both up and downstream monitoring at each of the 2 locations, during the high flow season only.

The proposed methodology for the aquatic baseline assessment includes a (i) desktop assessment of the study area and a review of the available literature regarding the aquatic ecology within the vicinity of the study area, (ii) field assessments (bio-monitoring) of the PES (Present Ecological Status) of the aquatic habitat, fauna and flora, and (iii) one report assimilating the desktop assessment of study area, historical data with current conditions and expected impacts. The study will be based on 6 aquatic bio-monitoring sites. The proposed methodology is further detailed below:

- Desktop review

An initial desktop review of available literature including:

- Review of the fish species and macro-invertebrate families expected to occur within the study area;
- Review of the potential presence of rare / endangered fish species and / or of exotic fish species;
- Review of historical bio-monitoring and water quality surveys conducted within the catchment; and
- Review of available literature on the status of the systems within the area.

- Field Work

In accordance with the DWA Section 21(i) and (c) supplementary water use license requirements, the PES of the habitat, water quality, aquatic macro-invertebrates and fish assemblages must be assessed for any development that may impact on the flow of water in a watercourse or that may alter the beds, banks or characteristics of a watercourse. The aquatic assessment will follow the DWA approved River Health Programme (RHP) methodologies. The number of bio-monitoring sites has been based on the proposed pipeline route and includes 6 bio-monitoring points. The number of points required may vary after the initial

investigation. The high flow aquatic assessment will be undertaken in early summer. The following aquatic aspects will be assessed:

1. Riparian and in-stream habitat

- Fluvial geomorphology: a brief baseline description of the fluvial geomorphology will be provided, based on the RHP site characterisation field manual by Dallas (2005).
- Vegetation: a description of the riparian vegetation zones and species composition will be conducted.
- Habitat Integrity: Impacts on habitat will be evaluated using the Index of Habitat Integrity (IHI) derived by Kleynhans (1999) and the habitat availability will be assessed using the RHP site characterisation field manual by Dallas (2005).

2. Water quality

- In-situ water quality data including pH, temperature, dissolved oxygen, TDS and electrical conductivity will be analysed for at each site.
- Water samples will be collected and analysed for the following constituents: Turbidity, Suspended Solids, Nitrates, Nitrites, Orthophosphates, Ammonia, Sulphates, Chloride, COD, as well as Al, Ca, Fe, Mg, Mn, Na, Cr, Cu, Ni, Cd, Co, Pb and Zn.

3. Biota

- Aquatic macro-invertebrate assemblage assessment: Aquatic macro-invertebrate sampling will be conducted using the South African Scoring System version 5 (SASS5) methodologies, according to Dickens and Graham (2002), as well as the Macro-invertebrate Response Assessment Index (MIRAI) methodology (Thirion, 2007).
- Assemblage assessment: Sampling will be undertaken using standardised methodologies as per the Fish Response Assessment Index (FRAI) (Kleynhans, 2007). The data collected will be used to determine the PES for the fish assemblage in accordance with FRAI as well as the conservation status of species present.

- Report compilation

A detailed specialist report will be compiled stipulating the current ecological status along with the current impacts, limitations and relevant recommendations and will include the following:

- Detailed description of study area including importance and sensitivity of the watercourses and their characteristics;
- A legislative review of applicable legislation / policies and guidelines;
- Methodology covering detailed descriptions of all aquatic bio-monitoring related methods;
- Baseline conditions including:
    - PES based on the macro-invertebrate and fish responses as well as the water quality and habitat indicators will be discussed and the results mapped and visually represented.
    - The presence of aquatic fish species of conservation significance as well as exotic faunal and floral species present.
    - Incorporation / comparison of reference and historical data with the current data obtained in this study.
- Impact Assessment detailing the predicted impacts the receiving environment will experience as a result of the activities;
- Fatal flaws (if any) to the proposed activities;
- Migratory and management measures required;
- Conclusions and recommendations; and
- Assumptions and limitations.

8.2.3.4 Hydrological Assessment

Based on the proposed developments, impacts on the hydrological regime of the site, surface water quality, and groundwater quality is possible. In order to update the EMPR conducted in 2002 to include these potential impacts, the following studies are to be undertaken during the EIA phase.

- Desktop Review and Gap Analysis

A desktop study of previous reporting available for the RPM will be conducted. This will determine where gaps exist in the vicinity of the proposed development. This study will be used to guide the scope of work outlined below.

- Hydrological Study
  - Historical review: Due to the potential for the proposed development to impact the flow regime in the area through the transfer of water between watercourse catchments, and the development of the stormwater dam, an assessment of the potentially impacted hydrological regime will be determined.
  - Floodline Assessment: The proposed stormwater dam and pipeline is expected to lie in close proximity to watercourses (with the pipeline crossing the Klipgatspruit at 3 different points). To determine the impacts of peak flows on these developments, a floodline assessment will be conducted.
  - Wetland Delineation: To determine the impact of the development on wetlands in the area, a wetland delineation and functional assessment will be conducted.
  - Water Balance: Due to the influence of the proposed developments on the hydrological regime of the catchments, the water balance previously compiled for the mine (EMPR, SRK, 2002 will be updated accordingly to take into account the influence of water transfers and the proposed stormwater dam.
- Surface water quality
  - Historical review: Surface water monitoring has been undertaken to date at the site. In order to determine the baseline surface water quality, these results will be reviewed. The outcome will be utilised to guide on-going monitoring, with recommendations made to improve the monitoring programme where necessary.
- Groundwater
  - Historical review: Groundwater monitoring of available wells has been conducted previously. These results will be reviewed to determine the baseline groundwater quality. Based on the findings recommendations for future monitoring will be portrayed.
  - Hydrocensus: Although a hydrocensus was conducted previously, this should be updated to include current water users and boreholes expected to be influenced by the project.
- Water Management / Action Plan

The existing water management plan will be updated to include the studies outlined above. This will include the following:

- Infrastructure requirements
- Environmental aspects and characterisation;
- Objectives and targets;
- Risk / Impact assessment;
- Implementation of Environmental Programmes and operational controls;
- Monitoring and reports; and
- Emergency preparedness and response.

8.2.3.5 Social-Economic Impact Assessment

WSP will undertake a Social Impact Assessment (SIA) investigation in order to identify and assess the social and socio-economic aspects and impacts associated with the proposed project. The EMPR conducted in 2002 provides detailed baseline information on the Anglo's mining lease areas, including the farms Waterval, Klipfontein and Hoedspruit, and community surveys of the Photsaneng, Thekwane and Mfidike areas. This information derived from the 2002 EMPR may be utilised in order to understand baseline conditions in the area (along with other information sources). A brief overview of the SIA methodology is provided below:

- Updating of Baseline Description

WSP will undertake a desktop review of existing information for the Rustenberg area, and a site orientation visit will be undertaken to verify desktop findings. The desktop review is likely to included, but may not be limited to, the following documents:

- Past social and environmental impact assessments for the Rustenburg mining operations, specifically Klipfontein and Waterval;
- The Bojanala Platinum District Municipality - Integrated Development Plan; and
- The Rustenburg Local Municipality - Local Integrated Development Plan.

In addition, the following data and information was reviewed to provide background information for the project area:

- Statistics South Africa Census 2001 data;
- Statistics South Africa Community Survey (2007); and
- Topographical Maps (1:50 000) and aerial photography.

An initial site visit will be undertaken in order to establish the existing socio-economic landscape through ground-truthing. Aspects to be observed are likely to included identification of local communities, spatial layout of communities and amenities, and surrounding land uses. Informal meetings with local authorities are proposed to provide insights into local socio-economic challenges, issues and priorities.

- Data Collection

Primary data collection is deemed necessary to contribute to the evaluation of the potential impacts of the proposed re-processing project. Primary data will be collected through a process of interviews with key local stakeholders so as to determine the magnitude and extent of the socio-economic impact at a local level. The aim will be to obtain data which will assist with the identification and description of the key socio-economic issues and impacts associated with the project.

WSP will develop interviews and questionnaires to be implemented with representatives of the local community, authorities and AAP. All interviews and discussions will be documented and kept on record for assessment and identification of the key socio-economic issues.

- Data Analysis and Assessment

The socio-economic issues will be analysed from the information collected through the primary data collection and desktop phases. It is envisaged that the issues would be considered in two streams. The first of these would be the potential negative issues associated with the re-processing project. The second would be to look at the potential positive issues associated with the proposed project.

- Reporting and Recommendations

A report incorporating the above elements will be produced. The report will include an assessment of the key socio-economic impacts associated with the proposed project, as well as the "no-go" alternative. The report will make recommendations for mitigation measures to be considered in the design and operation of the project. As part of the SIA report, WSP will compile a Social Management Plan, which will be incorporated into the revised EMPR.

8.2.4 Impact and Risk Assessments and Ratings Methodology

This chapter documents the EIA that will be undertaken to determine the environmental impacts that could result from the proposed project. The first stage of impact assessment is the identification of environmental activities, aspects and impacts. This is supported by the identification of receptors and resources, which allows for an understanding of the impact pathway and an assessment of the sensitivity to change. The significance of the impact is then assessed by rating each variable numerically according to defined criteria as outlined in **Table 13** to **Table 17**. The purpose of the rating is to develop a clear understanding of influences and processes associated with each impact. The severity, spatial scope and duration of the impact together comprise the consequence of the impact and when summed can obtain a maximum value of 15. The frequency of the activity and the frequency of the impact together comprise the likelihood of the impact occurring and can obtain a maximum value of 10. The values for likelihood and consequence of the impact are then read off a significance rating matrix as shown in **Table 16**.

Natural and existing mitigation measures, including built-in engineering designs, were included in the pre-mitigation assessment of significance. Measures such as demolishing of infrastructure, and reinstatement and rehabilitation of land, are considered post-mitigation.

Table 13: Severity of Impact

SEVERITY OF IMPACT	RATING
Insignificant / non-harmful	1
Small / potentially harmful	2
Significant / slightly harmful	3
Great / harmful	4
Disastrous / extremely harmful	5

Table 14: Spatial Scope of Impact

SPATIAL SCOPE OF IMPACT (Extent)	RATING
Activity specific	1
Area specific	2
Whole project site / local area	3
Regional	4
National	5

Table 15: Duration of Impact

DURATION OF IMPACT	RATING
One day to one month	1
One month to one year	2
One year to ten years	3
Life of operation	4
Post closure / permanent	5

CONSEQUENCE

Table 16: Frequency of Activity / Duration of Aspect

FREQUENCY OF ACTIVITY / DURATION OF ASPECT	RATING
Annually or less / low	1
6 monthly / temporary	2
Monthly / infrequent	3
Weekly / life of operation / regularly / likely	4
Daily / permanent / high	5

Table 17: Frequency of Impact

FREQUENCY OF IMPACT	RATING
Almost never / almost impossible	1

LIKELIHOOD

Very seldom / highly unlikely	2
Infrequent / unlikely / seldom	3
Often / regularly / likely / possible	4
Daily / highly likely / definitely	5

- **Activity:** a distinct process or task undertaken by an organisation for which a responsibility can be assigned.
- **Environmental aspect:** an element of an organisation's activities, products or services which can interact with the environment.
- **Environmental impacts:** consequences of these aspects on environmental resources or receptors.
- **Receptors:** comprise, but are not limited to people or man-made structures.
- **Resources:** include components of the biophysical environment.
- **Frequency of activity:** refers to how often the proposed activity will take place.
- **Frequency of impact:** refers to the frequency with which a stressor will impact on the receptor.
- **Severity:** refers to the degree of change to the receptor status in terms of the reversibility of the impact; sensitivity of receptor to stressor; duration of impact (increasing or decreasing with time); controversy potential and precedent setting; threat to environmental and health standards.
- **Spatial scope:** refers to the geographical scale of the impact.
- **Duration:** refers to the length of time over which the stressor will cause a change in the resource or receptor.

The model outcome of the impacts is then assessed in terms of impact certainty and consideration of available information. The Precautionary Principle is applied in line with the NEMA in instances of uncertainty or lack of information by increasing assigned ratings or adjusting final model outcomes. In certain instances where a variable or outcome requires rational adjustment due to model limitations the model outcomes are adjusted. Arguments and descriptions for such adjustments, as well as arguments for each specific impact assessments are presented in the text and encapsulated in the assessment summary table linked to each impact discussion.

Table 18: Consequence / Likelihood

CONSEQUENCE (Severity + Spatial Scope + Duration)															
LIKELIHOOD (Frequency of Activity + Frequency of Impact)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30
	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45
	4	8	12	16	20	24	28	32	36	40	44	48	52	56	60
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75
	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90
	7	14	21	28	35	42	49	56	63	70	77	84	91	98	105
	8	16	24	32	40	48	56	64	72	80	88	96	104	112	120
	9	18	27	36	45	54	63	72	81	90	99	108	117	126	135
	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150

Colour Code	Significance Rating	Value	Negative Impact Management Recommendation	Positive Impact Management Recommendation
	VERY HIGH	126-150	Improve current management	Maintain current management
	HIGH	101-125	Eliminate, avoid, implement	Maintain current management

			specific action plans/procures / improve current management	
	MEDIUM-HIGH	76-100	Proactively manage/ improve current management	Maintain current management
	LOW-MEDIUM	51-75	Actively manage, maintain current management	Improve current management
	LOW	26-50	Monitor and manage as appropriate / maintain current management	Improve current management
	VERY LOW	1-25	Maintain current management	Improve current management

8.2.5 Environmental Impact Assessment

The contents of the EIR will include the following:

- Details of the EAP who compiled the report and their expertise to carry out an EIA;
- Detailed description of the proposed activity;
- Description of the property on which the activity is to be undertaken and the location of the activity on the property;
- A description of the environment that may be affected by the activity and the manner in which the physical, biological, socio-economic and cultural aspects of the environment may be affected by the proposed activity (pre-development description of the environment);
- Details of the stakeholder engagement conducted during the scoping phase and the on-going consultation during the EIA phase;
- Description of the need and desirability of the proposed activity and identified potential alternatives to the proposed activity, including advantages and disadvantages that the proposed activity or alternatives may have on the environment and the community that may be affected by the activity;
- An indication of the methodology used in determining the significance of potential environmental impacts;
- A description and comparative assessment of all alternatives identified during the EIA process;
- A summary of the findings and recommendations of any specialist report or report on a specialised process;
- A description of all environmental issues that were identified during the EIA process, and assessment of the significance of each issue and an indication of the extent to which the issue could be addressed by the adoption of mitigation measures;
- An assessment of each identified potentially significant impact including cumulative impacts, the nature of the impact, the extent and duration of the impact, the probability of the impact occurring, the degree to which the impact can be reversed; the degree to which the impact may cause irreplaceable loss of resources, and the degree to which the impact can be mitigated;
- A description of assumptions, uncertainties and gaps in knowledge;
- An opinion as to whether the activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;
- An environmental impact statement which contains a summary of the key findings of the environmental impact assessment and a comparative assessment of the positive and negative implications of the proposed activity and identified alternatives;
- A draft EMPR;
- Compilation of a specialist volume; and

- Any specific information that may be required by the competent authority.

8.2.6 Environmental Management Programme Report

During the compilation of the EIR, a draft EMPR will be compiled in accordance with the NEMA EIA Regulations and the MPRDA. The draft EMPR will provide the actions for the management of identified environmental impacts emanating from the proposed project and a detailed outline of the implementation programme to minimise and / or eliminate the anticipated negative environmental impacts.

The draft EMPR will provide strategies to be used to address the roles and responsibilities of environmental management personnel onsite, and a framework for environmental compliance and monitoring. The draft EMPR will be complied as part of the EIR and consolidated into an EMPR amendment document. The EIR component will be authorised by the NW DEDECT and the EMPR amendment will be authorised by the DMR.

The draft EMPR will include the following:

- Details (including expertise) of the person who prepared the draft EMPR;
- Information on any proposed management or mitigation measures that will be taken to address the environmental impacts that have been identified in the EIR, including environmental impacts or objectives in respect of planning and design, pre-construction and construction activities, operation or undertaking of the activities, rehabilitation of the environment and closure where relevant;
- A detailed description of the aspects of the activity that are covered by the draft EMPR;
- An identification of the people who will be responsible for the implementation of the measures;
- Where appropriate, time periods within which the measures contemplated in the draft EMPR must be implemented;
- Proposed mechanisms for monitoring compliance with the draft EMPR and reporting thereon (i.e. procedures);
- Mitigation measures to rehabilitate the environment affected by the undertaking of any listed activities or specific activities back to its natural or predetermined state or to a land use which conforms to the generally acceptable principles of sustainable development;
- Time periods for which management measures must be implemented;
- The process for managing any environmental damage, pollution, pumping and treatment of extraneous water or ecological degradation as a result of undertaking a listed activity;
- An environmental awareness plan;
- Where appropriate, closure plans including closure objectives; and
- An updated financial provision in relation to the execution of the EMPR.

8.2.7 EIR / EMPR Review and Submission

The draft EIR and draft EMPR report (known as the EMPR amendment document) will be made available for public and state department review for a period of 40 days. Stakeholders will have the opportunity to view the draft reports and submit their comments, issues and concerns to WSP.

The comments from the public review period will be incorporated into a finalised report that is submitted to NWDEDECT and DMR for review and authorisation. The relevant departments have a legislated period of between 120 days in which to provide a decision on the proposed project after acknowledgement of receipt (14 days after final submission).

Once authorisation has been received, WSP will notify all registered stakeholders of the decision and manage an appeal process in accordance with the NEMA EIA Regulations of 2010.

8.3 Authority Consultation

Relevant Competent Authorities (DMR and NW DEDECT) as well as commenting authorities (RLM, DWA, etc.) will be consulted formally and informally throughout the environmental authorisation process. Formal consultations will be through authority meetings and an authority feedback meeting during the EIA phase. Informal consultation shall be through *ad hoc* discussions and telephonic and email communication. All authorities, including the Competent Authorities and commenting authorities will be notified of the availability of the draft documentation for public and state department review.

8.4 Proposed Methodology to Assess Anticipated Impacts and Alternatives

The potential environmental impacts of the proposed project will be evaluated according to their severity, duration, extent and significance of the impact. The Anglo Platinum 5x5 Risk Assessment Matrix will be used for the ranking of the impacts.

8.5 On-going Stakeholder Engagement

Consultation with stakeholders and authorities will continue into the EIR / EMPR phase. Consultation will continue in the form of:

- An open channel of communication that has been established during the scoping phase and will be maintained during the EIR / EMPR phase. The EAP has provided WSPs contact details to the stakeholders and authorities;
- Distribution of all project information and findings to registered stakeholders;
- Review of all reports to be submitted;
- Information in the media and press; and
- Scoping report feedback and EIR / EMPR public meeting.

9 Conclusion

The scoping phase was undertaken in line with the requirements of the MPRDA, the NEMA and additional legislation and guidelines listed in **Section 5**. The information contained in this scoping report provides a comprehensive description of the purpose of the proposed project. Furthermore, as the proposed project infrastructure and activities have not been included in the RPM approved EMPR, the EMPR Amendment process will incorporate all the project proposed infrastructure and activities.

The plan of study for the EIA and EMP, contained in this report, describes the proposed approach in which issues raised in the scoping phase will be addressed in detail. During the EIA phase, the issues identified during the scoping phase will be studied in detail and assessed to identify significant impacts and to design appropriate mitigation measures.

An important part of any scoping phase is stakeholder engagement. The stakeholder engagement was initiated from the onset of the project to ensure that all stakeholders were adequately and effectively consulted.

The following environmental aspects were screened during the Scoping Phase and will be further investigated during the EIA phase:

- Socio-Economic;
- Biodiversity;

- Surface and Groundwater;
- Air Quality;
- Traffic;
- Visual;
- Noise;
- Safety;
- Culture and Heritage; and
- Soils, Land Use and Land Capability.

Potential environmental and social impacts identified, which will be investigated in the EIA phase, included:

- Loss of grazing capacity along pipeline route;
- Loss in agricultural potential along pipeline;
- Obstacles to movement of people and livestock due to overland pipeline;
- Potential for spills of fuels and other chemicals during construction and operation;
- Pipeline leaks during operation;
- Loss of terrestrial habitat;
- Loss of aquatic / wetland habitat and habitat for bird species;
- Disturbance and displacement of fauna / avifaunal species;
- Faunal interaction with structures, servitudes and personnel;
- Impact on surrounding habitat and species;
- Increase in environmental degradation;
- Introduction / spread of alien species;
- Loss of species diversity;
- Soil erosion from changes in surface water flow due to construction of infrastructure;
- Surface water pollution due to spills of fuels or chemicals during construction and operation;
- Removal of vegetation on the TSFs prior to reclamation may increase surface water runoff as well as the entrainment of tailings materials into the surface water and final deposition and sedimentation of the Klipgat Return Water Dam;
- Positive impact of the reduction of tailings volume due to reprocessing thereby reducing the potential impacts / risks to ground water at final mine closure in the future;
- Particulate matter (dust) impacts from the Waterval TSF during construction phase due to removal of vegetation on the TSF prior to reclamation;
- Particulate matter from the Hoedspruit TSF during operation, where the tailings from the WLTR are deposited;
- Construction vehicles using the existing road networks to access the proposed site and pipeline route;
- Increase in the number of vehicles on the existing networks during operational phase;
- Loss of cultural / heritage resources;
- Release of greenhouse gas emissions;
- Degradation of air quality;
- Surface water pollution;

- Aquatic systems (ecosystem functioning);
- Groundwater pollution;
- Safety;
- Aesthetics (visual); and
- Regional economic benefit.

WSP will undertake the following activities after submission of the draft scoping report to the authroities:

- WSP will ensure that all comments received from stakeholders and authorities are incorporated into the Issues Trail;
- WSP will update the draft scoping report and submit the final scoping report to Authorities and stakeholders for review;
- WSP will update the final scoping report and submit the final report to the project case officer;
- WSP will furnish the Case officer with additional information should a request be received;
- WSP will compile and submit the draft EIR/EMPR for state and stakeholder review, on acceptance of the draft scoping report by the relevant Departments;
- WSP will update the EIR/EMPR and submit the final report to the project case officer;
- WSP will furnish the Case officer with additional information should a request be received; and
- WSP will notify the registered stakeholders on receipt of the decision from the Department.

Throughout the process stakeholders and I&APs will be engaged to ensure that their comments and concerns are taken into consideration and that they form an integral part of the environmental authorisation process.

10 References

Anglo American Platinum Limited: Rustenburg Platinum Mines Limited, 2009: Socio-economic Assessment Toolbox. Anglo American Platinum Limited internal documentation.

Anglo American Platinum Limited: Rustenburg Platinum Mines Limited, 2011: Community Engagement Plan (CEP). Anglo American Platinum Limited internal documentation.

Botha, P.R., Maslen, R.N., and Nicholls, H.A. (2002): Environmental Management Programme (Amendment): Western Limb Tailings Retreatment Project: Final Report, Envirolink, Southern Africa.

Cosijn, C. and Tyson, P.D. (1996): Stable discontinuities in the atmosphere over South Africa, South African Journal of Science, 92 (8), 381 – 386.

Dallas, H.F., (2005): RIVER HEALTH PROGRAMME: SITE CHARACTERISATION FIELD-MANUAL AND FIELD-DATA SHEETS, Department of Water Affairs and Forestry.

Dickens, C.W.S., and Graham, P.M. (2002): The South African Scoring System (SASS) Version 5 Rapid Bio-assessment Method for Rivers, African Journal of Aquatic Science, 27: 1-10.

Freiman, M.T. and Piketh, S.J. (2003): Air transport into and out of the industrial Highveld region of South Africa, Journal of Applied Meteorology, 42, 994 – 1002.

Garstang, M., Tyson, P.D., Swap, R., Edwards, M., Kållberg, P., and Lindesay, J.A. (1996): Horizontal and vertical transport of air over southern Africa, Journal of Geophysical Research, 101 (D19), 23 721 – 23 736.

Gondwana, (2011): Bonjanala Platinum District Municipality, Air Quality Management Plan. Available online at: http://www.gondwanagroup.co.za/File/BPDMRNGESAQMPdraft_20110613.pdf.

Kleynhans, C.J., (1999): The development of a fish index to assess the biological integrity of South African rivers. Water SA, 25 265-278.

Rustenburg Local Municipality (2011): Integrated development Plan: 2011/2012. Available online at: www.rustenburg.gov.za.

THIRION, C. (2007): RIVER ECOCLASSIFICATION MANUAL FOR ECOSTATUS DETERMINATION, Department of Water Affairs & Forestry, Pretoria.

TWP (2002): Re-mining of Waterval Project: Pre-Feasibility Report. February 2012.

Tyson, P.D., Garstang, M., Swap, R., Kållberg, P. and Edwards, M. (1996): An Air Transport Climatology for Subtropical southern Africa, International Journal of Climatology, 16, 265 – 291.

Tyson, P.D. and Preston-Whyte, R.A. (2000): The Weather and Climate of Southern Africa, Oxford University Press, Southern Africa, 285 – 304.

US EPA (2011): Health Effects of Pollution. Available online at: http://www.epa.gov/region07/air/quality/health.htm.

Anonymous, (2002): Ecological Assessment for the Western Limb Tailings Re-treatment project (Report no. 4940/2761/1/E): Wates, Meiring & Barnard, South Africa.

Tel: +27 11 361 1395
Fax: +27 86 250 0693
www.wspenvironmental.co.za