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ANGLO AMERICAN PLATINUM LIMITED

DISHABA MINE BACKFILL PROJECT

DRAFT SCOPING REPORT PREPARED IN TERMS OF REGULATION 49 (NO. R527 OF 2004) OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, NO. 28 OF 2002 AND REGULATION 28 OF THE ENVIRONMENTAL IMPACT ASSESSMENT REGULATIONS, NO. R543 OF 2010, IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, NO. 107 OF 1998

August 2012

Prepared for:

ANGLO AMERICAN

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DMR REF. NO. MP 6/2/2/48 EM | LEDET REF. NO. 12/1/9/2-W29

REVISION TABLE

REV	DATE	AUTHORS	INTERNAL REVIEW	EXTERNAL REVIEW
1 – 6	02/04/2012	Jonathan Shippon, Zoë Gebhardt, Stephan Geyer	Jonathan van de Wouw Peter Theron	None, issued for revision internally
7	21/05/2012			Issued for Client review
8-10	28/06/2012		Jonathan van de Wouw	Internal Revision
11	12/07/2012		None	Issued for Client Approval
12	06/08/2012		None	Issued for Public Comment

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DRAFT SCOPING REPORT FOR THE DISHABA MINE BACKFILL PROJECT

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LIST OF ACRONYMS

Amplats	Anglo American Platinum Limited
Anglo	Anglo American plc
BIC	Bushveld Igneous Complex
BGL	Below Ground Level
CED	Community Engagement Department
CSIR	Council for Scientific and Industrial Research
DEAT	Department of Environment and Tourism
DMR	Department of Mineral Resources
DWA	Department of Water Affairs
DWAF	Department of Water Affairs and Forestry
dBA	A-weighted decibels
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EMP	Environmental Management Programme
GSW	Gland Service Water
IAP	Interested and Affected Parties
IDP	Integrated Development Plan
IEM	Integrated Environmental Management
IWULA	Integrated Water Use Licence Application
LDEDET	Limpopo Department of Economic Development Environment and Tourism
LoM	Life of Mine
MAP	Mean Annual Precipitation
MAR	Mean Annual Rainfall
MPRDA	Mineral and Petroleum Resources Development Act No. 28 of 2002
MSA	Middle Stone Age
NB	Nominal Bore
NEMA	National Environmental Management Act No. 102 of 1998
NEMWA	National Environmental Management: Waste Act
NEMBA	National Environmental Management: Biodiversity Act
NEMAQA	National Environmental Management: Air Quality Act
NWA	National Water Act
OPC	Ordinary Portland Cement
PCD	Pollution Control Dam
PGE	Platinum Group Element
PGM	Platinum Group Metals
PPP	Public Participation Process
RLS	Rustenburg Layered Suite
RPM	Rustenburg Platinum Mines Limited
SAHRA	South African Heritage Resources Agency

SANBI	South African National Biodiversity Institute
SANS	South African National Standards
SAWS	South African Weather Service
SOTER	Soil and Terrain Database
TDS	Total Dissolved Solids
TSF	Tailings Storage Facility
TWQR	Target Water Quality Ranges
WULA	Water Use License Application

1 INTRODUCTION AND BACKGROUND

1.1 Applicant

Name of Applicant/Owner:	Rustenburg Platinum Limited (RPM)
RPM Contact Details:	55 Marshall Street, Johannesburg, 2001 PO Box 62179, Marshalltown, 2107 Tel: (011) 373-6111 Fax: (011) 373-5111
Mine Contact person:	Mr. Jochemus Johannes Joubert (General Manager – Dishaba Mine)
Mine Environmental Manager:	Mr. Lesego Manzini
Mine's Physical Address:	Dishaba Mine Elandskuil 378 KQ Waterberg District Municipality Limpopo Province
Mine's Postal Address:	P.O. Box 2 Chromite 0362
Telephone Number:	(014) 784 2120/1111
Fax Number:	(014) 784 2232/1230
Email:	jj.joubert@angloamerican.com>
Commodity:	Platinum
Mineral Rights Ownership:	Elandskuil 378 KQ: RPM - Mining Licence 10/2003 Middellaagte 382 KQ: RPM - Mining Licence 10/2003 Amandelbult 383 KQ: RPM - Mining Licence 10/2003
Surface Rights Ownership:	Elandskuil 378 KQ: RPM - T 16987/1979 (ptn 1); Middellaagte 382 KQ: RPM - T 38966/1974 (R/E) Amandelbult 383 KQ: RPM - T 15698/1973 (farm)

1.2 Details of the Environmental Assessment Practitioner

Name of Environmental Assessment Practitioner	Prime Resources (Pty) Ltd
Physical Address:	70 - 7th Avenue, Parktown North, Johannesburg

Postal Address:	PO Box 2316, Parklands, 2121
Telephone Number:	011 447 4888
Fax Number:	011 447 0355
Email:	prime@resources.co.za
Professional Affiliations:	PrEng; PrSciNat, SAIMM

As required in terms of Section 17 of GNR543, the EIA Regulations of 2010, the applicant has appointed Prime Resources (Pty) Ltd to conduct the scope associated with this draft Scoping Report as well as the subsequent EIA / EMP. Prime Resources is an environmental consulting specialist firm providing environmental and related services and which was established in 2003. Prime Resources was founded by Peter Theron, the Managing Director of the firm, who has over 26 years' experience in the field of environmental science and engineering. Jonathan van de Wouw, the Project Manager and Senior Scientist for the Dishaba Backfill Project, has five years' experience in the field of environmental science. Below are short *Curricula Vitae* of the project team.

Peter Theron *BSc Civil Engineering, GDE (Hons.) Environmental Engineering*

Peter Theron is a Principal Environmental Consultant with 26 years' experience and Director of Prime Resources (Pty) Ltd. Peter began his professional career as a specialist geotechnical engineer, discard dump designer and later became involved in the technical aspects of mining and the environment. Implementation of environmental assessments, sustainable development, environmental project management, environmental due diligence and compliance auditing, geotechnical design, discard and waste management, mine closure and environmental costing are Peter's main areas of specialisation.

Jonathan van de Wouw *BSc (Hons)*

Jonathan is a senior environmental scientist with considerable experience managing projects in the mining sector, including the undertaking of Environmental Impact Assessments (EIAs) and the preparation of Environmental Management Programmes (EMPs), financial liability assessments associated with mine closure and rehabilitation, mine waste and water management planning, including the development of Integrated Water Use License Applications (IWULAs), environmental auditing, environmental due diligence. He also has a detailed knowledge of environmental law and precedents, both locally and internationally. Jonathan also has experience in integrated waste management planning solutions and mining right applications.

1.3 Project Overview and Location

Dishaba Mine is 100% owned and operated by Rustenburg Platinum Mines Limited (RPM), a company that is fully owned by Anglo American Platinum Limited (Amplats). Dishaba Mine (meaning coming together of nations) is a result of the restructuring of the Amandelbult Mine in 2009 into four business units (the other three business units are Tumela Mine, Amandelbult Concentrator Plants and Amandelbult Services). Dishaba Mine (Dishaba) is now a standalone

operational entity comprising the No. 2 shaft of the former RPM - Amandelbult Mine. The Dishaba Mine's infrastructure consists of: one vertical shaft, one raise bore and three incline shafts. Dishaba mines on both the Merensky and UG2 reef horizons and the mining method is scattered breast mining with strike pillars. The Life-of-Mine (LoM) extends to approximately 2055. Ore that is mined at Dishaba is processed at the Amandelbult Concentrator.

The proposed backfill project at the Dishaba Mine, commissioned in 2004, is required to ensure the continuation of mining. Introducing backfill will allow for the better distribution of potentially damaging mining-induced stress arising as a result of pillar punching in the Merensky hanging-wall. In order to accomplish this, it is proposed that a portion of the tailings from the existing feed from the neighbouring Amandelbult Concentrator to the existing tailings storage facilities (TSFs) be tapped-off and fed by a new delivery pipeline and pump station within the service road servitude connecting the Amandelbult TSFs to the Dishaba Mine, to a backfill plant situated at the Dishaba Shaft Complex. This project will ensure the continuation of safer mining activities at Dishaba Mine.

The Dishaba Mine is located in the Limpopo Province on the farms Amandelbult 383KQ, Middellaagte 382KQ and Elandskuil 378KQ and falls under the jurisdiction of the Thabazimbi Local Municipality (NP361) and the Waterberg District Municipality (DC36). Dishaba is situated approximately 40km south of Thabazimbi, 15km north of Northam and 100km north of Rustenburg. Neighbouring towns include Swartklip, Chromite and various other settlements like Amandelbult and Rethabile. Refer to Figure 1 for a map indicting the locality of the Dishaba Mine Backfill Project area.

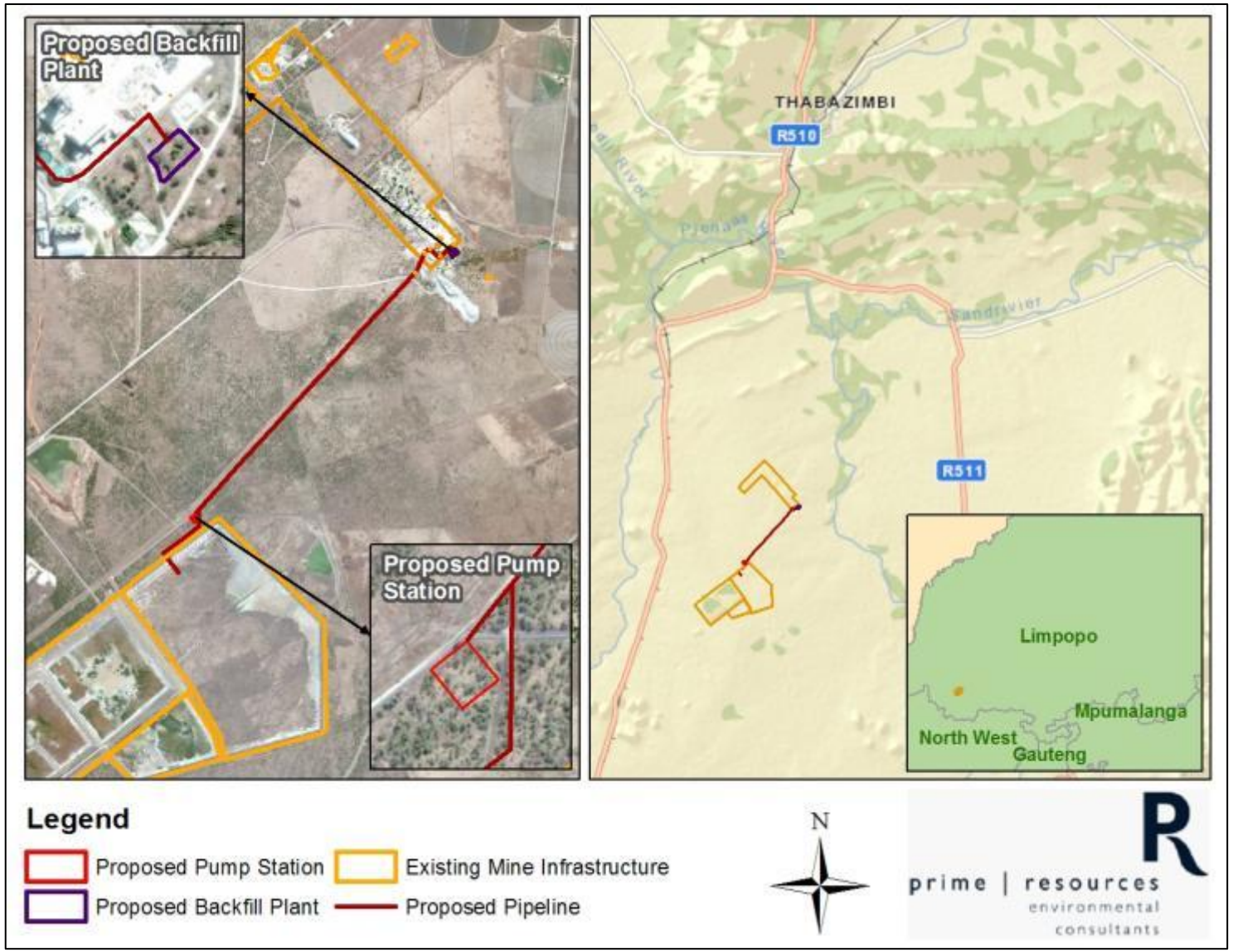


Figure 1: The locality of the Dishaba Backfill Project area.

1.4 Legal Requirements

South Africa's Constitution guarantees all its citizens the right to an environment that is not harmful to their health and / or wellbeing; 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. The Constitutional obligations of the State to protect the environment with respect to new development can only be met through the implementation, enforcement and monitoring of effective legislation.

In order to protect the environment and ensure that the proposed development is undertaken in an environmentally responsible manner, the following pertinent laws apply and guide this scoping assessment. They are as follows:

1.4.1 The Mineral and Petroleum Resources Development Act (No. 28 of 2002)

The MPRDA is the key legislation governing mining activities within South Africa. It details the requirements and processes which need to be followed and adhered to by mining companies. The Department of Mineral Resources (DMR) is the competent authority that deals with all mining related applications.

The MPRDA by definition:-

- Recognises that minerals and petroleum are non-renewable natural resources;
- Acknowledges that South Africa's mineral and petroleum resources belong to the nation and that the State is the custodian thereof;
- Affirms the State's obligation to protect the environment for the benefit of present and future generations, to ensure ecologically sustainable development of mineral and petroleum resources and to promote economic and social development;
- Recognises the need to promote local and rural development and the social upliftment of communities affected by mining;
- Reaffirms the State's commitment to reform to bring about equitable access to South Africa's mineral and petroleum resources.

This Scoping Report has thus been prepared to meet the requirements of Regulation 49 of the MPRDA Regulations of GN527, April 2004:

MPRDA REGULATION 49	CONTENT	CHAPTER
1(a)	The methodology applied to conduct scoping.	2
1(b)	The baseline status of the environment	3
1(c)	The anticipated environmental, social and cultural impacts, including cumulative effects	8

1(d)	A description of alternatives to the proposed operation and the "no project" option;	5
1(e)	A description of the most appropriate procedure to plan and develop the proposed mining operation i.e. "the Project Description"	3
1(f)	A description of the public consultation process and the outcomes thereof	7
1(g)	A description of the nature and extent of further investigations required in the EIA	9

This Scoping Report has further been prepared in terms of the DMR Guideline for the compilation of a scoping report:

DMR GUIDELINE SECTION G	CONTENT	CHAPTER
1.	Identify the landowner or lawful occupier of the land in question, and any other interested and affected party (IAP), including the community, who may be affected by the application and retain a list specifying the names and describing the role of such parties identified for submission to the Regional Manager.	7
2.	Notify the landowner or lawful occupier of the land in question, and any other IAP, including the community, of the application and retain proof of such notification for submission to the Regional Manager.	7
3.	Consult with such landowner or lawful occupier, including the community, and any other identified IAP.	7
4.1	The methodology applied to conduct scoping.	2
4.2	A description of the existing status of the cultural, socio-economic and biophysical environment.	3
4.3	An identification of the anticipated environmental, social or cultural impacts.	8
4.4	A description of any proposed land use or development alternatives.	5
4.5	A description of the most appropriate procedure to plan and develop the proposed mining operation.	4
4.6	A description of the process of engagement	7
4.7	Describe the nature and extent of further investigations required in the environmental impact assessment report	9

1.4.2 The National Environmental Management Act (No. 107 of 1998) and the Environmental Impact Assessment Regulations (GNR 543 of 2010)

This Act is enabling legislation intended to provide a framework for integrating environmental management into all developmental activities to promote co-operative environmental governance with regard to decision making by state organs on matters affecting the environment.

The principles of NEMA are laid out in Section 2:

- To avoid and minimize disturbance to ecosystems or loss of biological diversity and to rectify damage where possible;
- To avoid, minimize and remediate pollution and degradation;
- Avoid and minimize the creation of waste and to promote recycling and re-use where possible;
- Negative environmental impacts must be anticipated and prevented where possible, and where that is not possible, impacts must be minimised and remedied;
- The social and economic impacts must also be considered together with environmental impacts of activities when making decisions.

These principles lend themselves to the ideal of Integrated Environmental Management (IEM). A vital component of the IEM principles is accountability to the various parties that may be interested in- or affected by a proposed development. Public participation in the formulation of development proposals is a requirement of the IEM procedure, in terms of the identification of truly significant environmental impacts by IAPs.

The IEM principles ensure that the environmental consequences of development proposals are understood and adequately considered during the conceptual design process, allowing negative aspects to be resolved or mitigated and positive aspects to be enhanced. It is thus a code of practice for ensuring that environmental considerations are fully integrated into all stages of development, by providing a procedural and regulatory mechanism for EIAs. These regulatory mechanisms are supplied in the form of the EIA Regulations and the subsequent listings which provide a toolkit for the assessment of impacts based on the scope of the project.

Section 28 of NEMA further stipulates that every person who causes-, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment. This section has been amended by the National Environmental Laws Amendment Act, No. 14 of 2009, which stipulates (in item 12), that the aforementioned duty of care to remediate applies to any significant pollution of degradation which:

- Occurred before the commencement of the Act;
- Arises or is likely to arise at a different time from the actual activity that caused the contamination; or
- Arises through an act or activity of a person that results in a change to pre-existing contamination.

The EIA Regulations GN543, June 2010 (as revised in December 2010), serve to regulate the procedure and criteria for submitting, processing and considering decisions for applications for environmental authorisation in order to avoid the commencement of activities which may have a detrimental impact on the environment. These Regulations provide details on the process to be followed for the consultation of stakeholders and IAPs, the identification of the Competent

Authority and the various timeframes and application requirements for environmental authorisation. A further three Regulations, GNR544, 545, 546, provide lists of activities for which environmental authorisation, either in the form of a Basic Assessment or Scoping and EIA / EMP, is required before the activity can commence.

The following activities listed in terms of the above are relevant to the proposed Dishaba Backfill project:

Table 1: Listed activities of the proposed Dishaba Backfill Project in terms of the EIA Regulations of 2010.

LISTING NOTICE	ACTIVITY NUMBER	LISTED ACTIVITY	DESCRIPTION
GNR545	5	The construction of facilities or infrastructure for any process or activity which requires a permit or license in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent and which is not identified in Notice No. 544 of 2010 or included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case that Act will apply.	For construction of the emergency backfill disposal paddock associated with the Backfill Plant which will require a license in terms of Section 21G of the National Water Act.

This Scoping Report has been prepared to meet the requirements of GNR543, Section 28, as indicated below:

GNR543 SECTION 28	CONTENTS	CHAPTER
1(a)(i) and (ii)	Details of the Environmental Assessment Practitioner (EAP) who prepared the report and the expertise of the EAP to carry out scoping procedures	1.2
1(b)	A description of the proposed activity	1.3; 3
1(c)	A description of any feasible and reasonable alternatives that have been identified	5
1(d)	A description of the property upon which the mining activities are to be undertaken and the location of the activity on that property	1.3
1(e)	A description of the environment that may be affected by the activity and the manner in which activity may be affected by the environment	3
1(f)	A description of the applicable legislation and guidelines	1.4
1(g)	A description of environmental issues and potential impacts, including cumulative impacts that have been identified	8

GNR543 SECTION 28	CONTENTS	CHAPTER
1(h)(i) - (iv)	Details of the public consultation process conducted	7
1(i)	A description of the need and desirability of the proposed activity	6
1(j)	Potential alternatives to the project and the associated advantages, disadvantages as regards the community and environment;	5
1(k)	Copies of any representations, and comments received in connection with the application or the scoping report from interested and affected parties	To follow [1]
1(l)	Copies of the minutes of any meetings held by the EAP with interested and affected parties and other role players which record the views of the participants	
1(m)	Any responses by the EAP to those representations and comments and views	7.3.5
1(n)(i) - (iv)	A plan of study for the assessment phase	9
1(o)	Any specific information required by the competent authority	None
1(p)	Any other matters required in terms of sections 24(4)(a) and (b) of the Act	None

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

The NEMAQA serves to repeal the Atmospheric Pollution Prevention Act (No. 45 of 1965).

Section 18(1) of the Act allows for the declaration of priority areas which are based on the following:

- If ambient air quality standards are being, or may be exceeded;
- If the area requires specific air quality management action.

GN248 of 31 March 2011 provides the list of activities in terms of Section 21(1)(a) for which a license is required in terms of Chapter 5 of the Act. However, none of the activities in terms of the above schedule will be triggered by the proposed Dishaba Backfill Project.

1.4.4 The National Heritage Resources Act (No. 25 of 1999)

The National Heritage Resources Act serves to protect and manage the South African heritage and cultural resources. These resources includes places, buildings, structures and equipment of cultural significance, historical settlements and townscapes, archaeological and paleontological sites, graves and burial grounds. The Act protects any heritage resources from damage by developments by stipulating in Section 38 that any person intending on undertaking any form of

[1] This draft scoping report is available for public comment. All minutes, comments and representation will be included in the final scoping report Appendices

development which involves the activities listed below must, at the earliest stage of initiation, notify the South African Heritage Resources Association (SAHRA):

A. the construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;
B. the construction of a bridge or similar structure exceeding 50m in length;
C. any development or other activity which will change the character of a site—
    i. exceeding 5 000 m^2 in extent; or
    ii. involving three or more existing erven or subdivisions thereof; or
    iii. involving three or more erven or divisions thereof which have been consolidated within the past five years; or
    iv. the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;
D. the re-zoning of a site exceeding 10 000m^2 in extent; or
E. any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority.

Section 38(8) of the Act states that if heritage considerations are taken into account as part of an application process undertaken in terms of NEMA and the EIA process, there is no need to undertake a separate application in terms of the National Heritage Resources Act. Heritage considerations therefore will form part of this environmental process. The proposed Dishaba Backfill Project will invoke the following listed activity;

SECTION	ACTIVITY NUMBER	LISTED ACTIVITY	DESCRIPTION
38	1(a)	The construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;	An above ground pipeline will be installed within an existing servitude connecting the TSFs at the Amandelbult Concentrator to the Dishaba Mine. The pipeline, which will be on plinths, will run from the pump station for a distance of 4km to the Dishaba No. 2 Shaft.

The listed heritage considerations will be taken into account as part of the environmental application process. The public consultation procedure will include SAHRA as an IAP (discussed further in Chapter 7).

1.4.5 The National Water Act (No. 36 of 1998)

The National Water Act (NWA) regulates all matters relating to inland water resources. It thus operates as a management instrument with the lead authority being the Department of Water Affairs (DWA). This Act provides mechanisms for the prevention of the pollution of water resources to support the management of water as a renewable resource. Section 21 of the Act lists water uses for which authorisation is required from the DWA, while Section 39 identifies

several water uses where the need for a license is dispensed with. The use of water for which a license is not required is also described.

Regulation 704 of 1999 provides regulations for the use of water for mining and related activities and is aimed to further protect water resources. This regulation describes how mining activities should be managed to protect water resources. The Act and Regulation thus play a crucial role in the mining process as many mining-related activities use water as listed in Section 21, thereby requiring approval from the DWA.

RPM have submitted an Integrated Water Use Licence Application (IWULA) including an IWWMP to the Limpopo Department of Water Affairs in August 2011, which comprised the water uses at Dishaba and which is currently being considered by the Department.

The following water use in terms of Section 21 of the NWA applies to the proposed Dishaba Backfill Project:

Table 2: Water Use Identified at Dishaba Backfill Project.

APPLICABLE SECTION OF NWA	DESCRIPTION OF WATER USE	APPLIES TO
Section 21(g)	The disposal / handling of waste or water containing waste that may potentially impact on a water resource	An emergency backfill disposal paddock will be constructed in close proximity to the Dishaba No. 2 shaft and the proposed Backfill Plant.

The relevant licensing form and technical supporting information as well as an Integrated Water and Waste Management Plan (IWWMP), applicable to the proposed Dishaba Backfill Project, will be prepared and submitted to the DWA for consideration.

1.4.6 The National Environmental Management: Waste Act (No. 59 of 2008)

The NEMWA serves to reform the laws regulating waste management in order to protect public and environmental health by providing measures for the prevention of pollution and ecological degradation and to provide defining requirements for the licensing and control of waste management activities.

This Act supersedes Section 20 of the Environment Conservation Act, No. 73 of 1989 (ECA) and provides measures for waste management covering the various aspects of activities which generate waste. The schedules attached to the Act also provide definitions for activities which require a waste management license, while also identifying the relevant environmental authorisations (either in the form of a Basic Assessment {Schedule A activities} or Scoping, EIA / EMP {for Schedule B activities} and prepared in terms of NEMA) which are further required for said activities.

None of the activities in terms of the above schedule will be triggered by the proposed Dishaba Backfill Project.

1.4.7 The National Environmental Management: Biodiversity Act (No. 10 of 2004)

The purpose of the NEMBA is to provide for the management and conservation of South Africa's biodiversity within the framework of the National Environmental Management Act (107 of 1998). This includes: the protection of species and ecosystems; the sustainable use of indigenous biological resources; the fair and equitable sharing of benefits arising from bioprospecting involving indigenous biological resources; and the establishment of a South African National Biodiversity Institute.

The Act stipulates that a National Biodiversity Framework must be adopted, which provides for the identification of priority areas for conservation, as well as an integrated, co-ordinated and uniform approach to biodiversity management in protected areas. It should also reflect regional co-operation with respect to biodiversity management. The Act defines a bioregion as a region containing whole or several, nested ecosystems. The goal of biodiversity management in these bioregions must be aimed at ensuring the long-term survival of species in nature.

None of the activities proposed by the Dishaba Mine Backfill Project, are associated with NEMBA.

1.4.8 Noise Regulations

Noise regulations exist to monitor, control and restrict noise pollution and ensure that communities and individuals are not exposed to detrimental noise pollution created by local commercial, industrial and recreational sources.

Continuous noise monitoring in mining areas must be routinely undertaken to ensure noise levels are kept within acceptable limits and do not become harmful or disturbing to surrounding communities and individuals.

Dishaba engages in regular routine noise monitoring to ensure that noise levels are within acceptable limits. Areas in close proximity to the Dishaba Shaft, such as the proposed location of the Backfill Plant, are characterised by slightly elevated ambient noise levels (which may exceed 45dBA), due to industrial noises emanating from the Dishaba Shaft. The proposed project noise levels are not expected to exceed current noise levels at the Dishaba Mine, thus none of the activities in terms of noise regulation will be triggered by the proposed Dishaba Backfill Project.

2 METHODOLOGY APPLIED TO CONDUCT SCOPING

The environmental process to be followed has been based on the requirements as stipulated in the MPRDA Regulations (GN527 of 2004) as well as NEMA and the EIA Regulations (GN543 of 2010). This report is the scoping phase as detailed in Section 49 of the MPRDA Regulations and Section 29 of the NEMA EIA Regulations (2010).

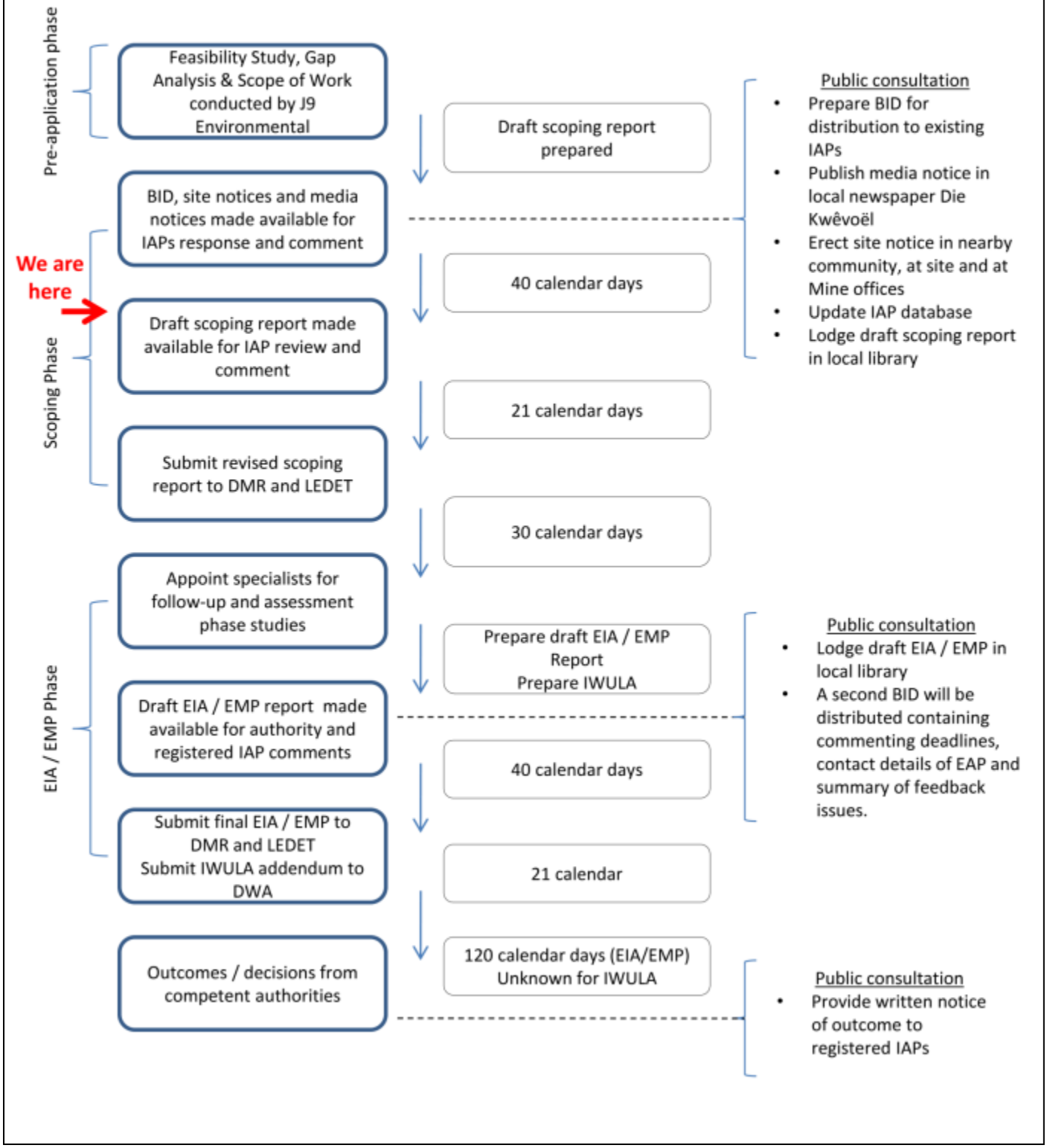
Initially, all existing environmental work and processes conducted for the Dishaba Backfill project were reviewed for relevance and applicability, including a feasibility study gap-analysis conducted by J9 Environmental. This Scoping Report has also been aligned to the Anglo and Amplats internal reporting requirements for feasibility studies.

Existing specialist studies, desktop research and historic information were utilised to inform the environmental baseline information presented in this scoping report. A site-visit was undertaken to survey the current *in situ* environmental conditions and to contextualise the proposed project. Meetings were held with Patterson and Cooke and RSV Engineers who are undertaking the engineering and design components of the proposed project to inform them of the environmental requirements and make suggestions accordingly.

A public involvement process will also be conducted to introduce the Dishaba Backfill project to IAPs as described in Section 7, to ascertain any concerns or issues for further investigation during the EIA / EMP Phase.

The process to be followed is outlined below:

Description of Activities



3 DESCRIPTION OF THE BASELINE ENVIRONMENT

3.1 Introduction

This chapter describes the baseline conditions of the environment likely to be affected by the proposed development. The information presented in this section was obtained from desktop searches for information in the public domain, available specialist reports, personal communications, and the approved EMPs / EIAs

3.2 Climate

3.2.1 Regional Climate

The Thabazimbi region experiences high temperatures in the summer months and low temperatures in the winter months.

The winds in this area are, on average, light to moderate and generally in a north-westerly direction during the summer months with westerly winds occurring more frequently in the winter months.

The warmer months of November through to March are characterised by high amounts of rainfall, whereas rainfall is generally low between the months of May and September. Rainfall varies from 217mm to 570mm per annum and the region is generally characterised by high intensity thundershowers that occur over a short duration.

3.2.2 Rainfall and Evaporation

The Dishaba Mine lies within the summer rainfall region of South Africa and thus approximately 90 percent of the Mean Annual Precipitation (MAP) occurs within the six month period between October and March, with only five percent of the MAP occurring between April and September. Evaporation rates are very high within the Thabazimbi region, the mean annual evaporation being 2017mm, which exceeds the mean annual rainfall amount.

Data for the Mean Annual Precipitation for the area was provided by the South African Weather Service (SAWS) Station number W0587447, refer to Table 3 for the data derived from this station.

3.2.3 Temperature

The project area has a temperate climate with warm summers and cold winters. The average monthly minimum and maximum temperatures are depicted in Table 3.

Table 3: Rainfall, Temperature and Evaporation data (W0587477, Northam and W0587725 Thabazimbi and WR 90).

Month	Average Rainfall (mm)	Max. 24 hr rainfall recorded (mm)	Date of Max Rainfall	Mean Daily Temperature (C)	Average Max. Temperature (C)	Average Min. Temperature (C)	S-Pan Evaporation (mm)
January	122	90	1995/01/12	25.2	31.8	18.6	199.8
February	79.6	99	1978/02/16	24.3	30.7	17.9	162.5
March	85.4	130.5	1969/03/11	23.1	30.0	16.2	155.0
April	37.8	50	1984/04/02	19.5	27.3	11.6	118.3
May	7.6	32.5	1976/05/04	15.4	25.3	5.5	97.9
June	2	16	1984/06/21	12.0	22.1	1.9	82.1
July	1.4	9	1970/07/16	12.5	22.5	2.4	90.9
August	2.5	10	1977/08/14	15.7	25.4	6.0	124.7
September	16.2	41	1997/09/10	20.0	28.4	11.6	165.6
October	52.2	57	1973/10/16	22.7	29.8	15.7	200.7
November	83.6	104	1994/11/05	23.9	30.6	17.1	198.2
December	103.1	163	1995/12/17	24.3	30.5	18.2	204.3
Total (Mean Annual)	593.4			19.9	27.9	11.9	1800.0

In terms of the maximum rainfall intensities, the highest 24 hour storm event recorded at the Dishaba Mine to date is 163mm (SAWS Gauge W0587477 – Northam).

3.3 Topography

The Dishaba Mine is situated in a relatively flat area. There are no pronounced geomorphological features in the area apart from two dominant conical hills to the south of the Mine and one toward the north around the town of Thambazimbi.

3.4 Geology

3.4.1 Regional geology

One of the largest layered mafic intrusions in the world, the Bushveld Igneous Complex (BIC), holds South Africa's Platinum Group Element (PGE) reserves. The BIC yields a wide range of mineral commodities, which include: vanadium, chrome, Platinum Group Metals (PGMs) and titaniferous magnetite.

The BIC is extensive in size and is roughly saucer shaped; norites, pyroxenites, chromotites and gabros are found at the rim of the saucer (inter-layered in a variety of combinations). The Merensky and UG2 Reefs are two stratiform deposits unique to the BIC that contain economically exploitable quantities of PGMs.

As depicted in Figure 2, the project area is situated in the north-western sector of the BIC. The Merensky and the UG2 Reefs are the two platinum bearing ore bodies that are currently being exploited; the dip of the ore bodies is toward the south-east. The Merensky Reef is comprised of

feldspathic pegmatoidal pyroxenite and is bounded by thin chromitite bands; the thickness of the reef varies from 10-300 cm. The underlying UG2 Reef is approximately 1.3-1.5m thick.

The UG2 horizon in the mining area consists of a uniform dipping ore body interspersed by areas of slumping and rolling, there are several large throw faults that have been demarcated from the Merensky workings which are more prevalent to the West of the Dishaba Mine.

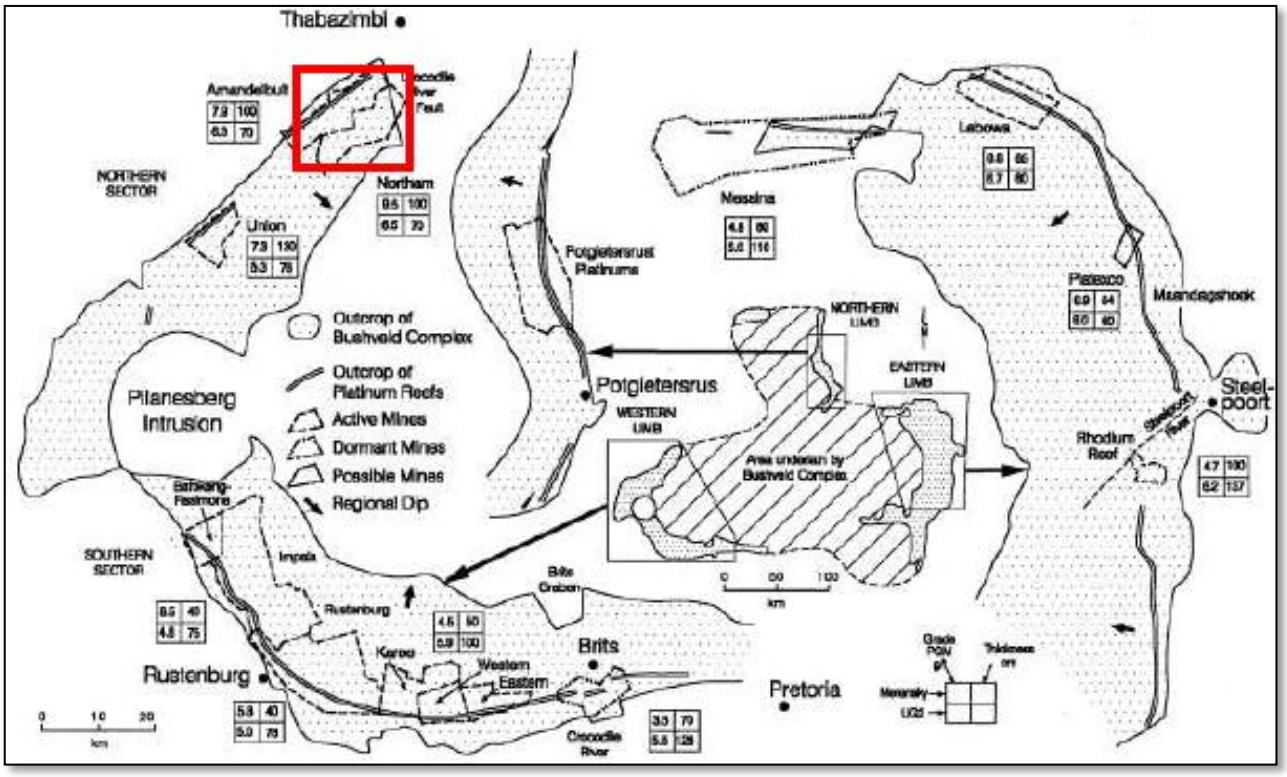


Figure 2: The position of the project area relation to the BIC centre (Crawthorn, 1999).

3.4.2 Local Geology

Cover material "black turf" in the study area comprises a minimum of 1m black silty clay of the Rustenburg type Arcadia Form, alluvial cover grades into residual material extending to 30m Below Ground Level (BGL). Regolith grades rapidly into fresh gabbro and norite of the BIC with weathering limited to fracture surface (Figure 3). Geological formations dip at 20 degrees and outcrops strike in a north-westerly direction. Across the site, regional diabase intrusions strike in a predominantly north-westerly direction with several north-south trending shear and/or fault zones crossing the study area.

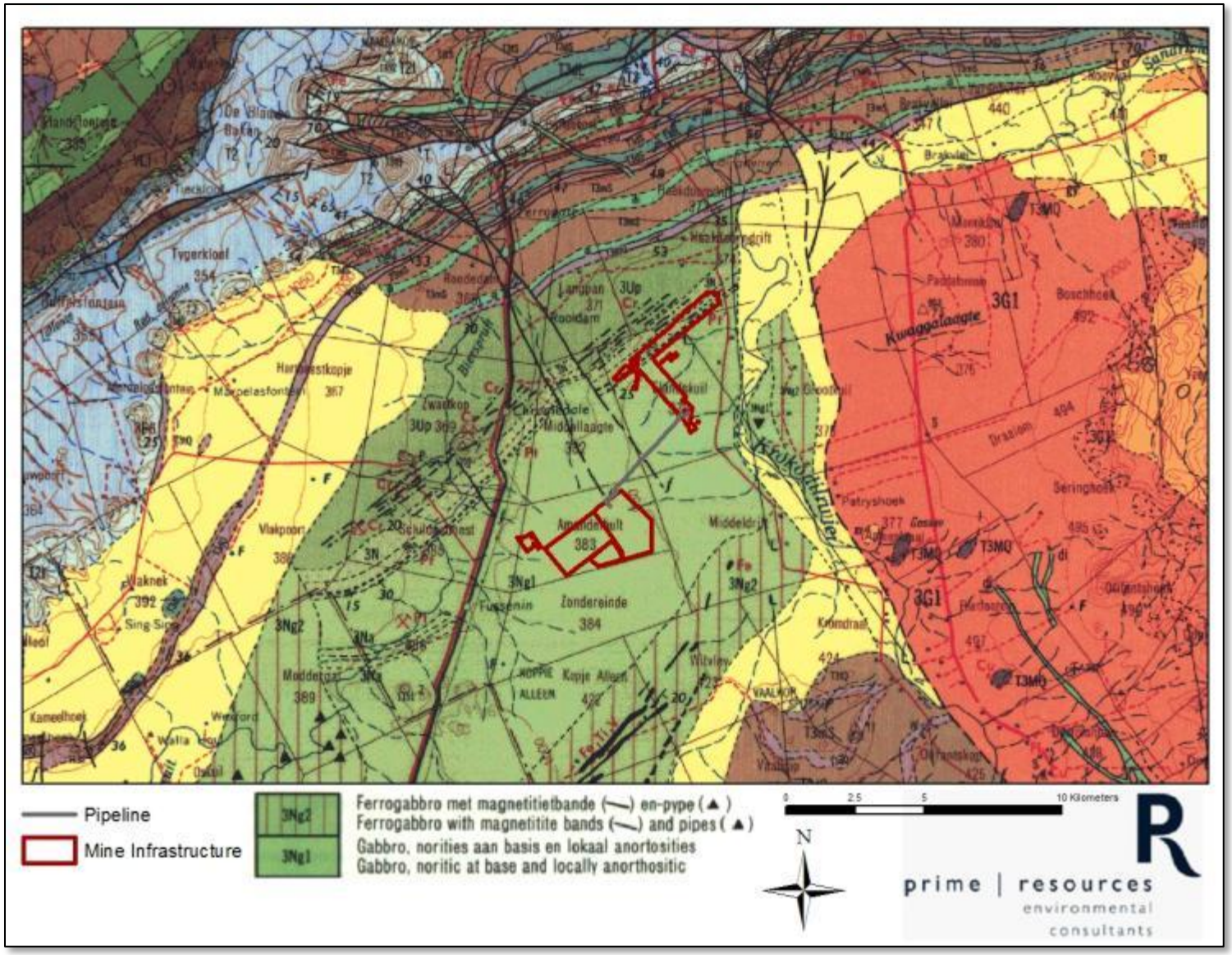


Figure 3: Local geology of the study area.

3.5 Soils

The information that follows was taken from a Soil, Land Use and Land Capability Assessment that was undertaken by WSP Environment and Energy and applies to surrounding, non-disturbed areas.

All soils in the study area are of the Arcadia form which is typical for this area, the Arcadia soils in the area range in thickness from 0.8 to 1.5m below ground level (bgl). The Arcadia soil form is comprised of a deep Vertic A Horizon with a calcareous B Horizon lens. The clayey soil is dark in colour and black when moist with a granular surface structure when dry, hexagonal desiccation cracks at the surface during the dry season indicates the presence of swelling clays.

The soil in the area is characteristically high in macro-nutrient elements (P,K,Ca and Mg) which may be associated with moderate to high fertility. The soil in the area is classified as sandy, silty clays. Clayey soils are typically characterised by poor drainage which may impede plant growth, thus the soils associated with the Dishaba Mine would have a negative impact on plant growth (in terms of soil structure).

Additionally, The World Soil and Terrain Database (SOTER) give a description of the soils which occur over the study area as follows (this information corresponds to Figure 4):

Table 4: Description of soils which occur over the study area

Soil	Properties
1	Red, massive or weakly structured soils with high base status (association of well drained Lixisols, Cambisols, Luvisols).
2	Soils with minimal development, usually shallow on hard or weathering rock, with or without intermittent diverse soils (association of Leptosols, Regosols, Calcisols and Durisols. In addition one or more of Cambisols, Luviso).
3	Black and red, strongly structured clayey soils with high base status (association of Vertisols, Phaoezems, Kastanozems and Nitisols. In addition, one or more Leptosols, Calcisols and Cambisols may be present).

The area earmarked for development of the proposed backfill project has already been disturbed by development of the tailings storage facilities associated with the Amandelbult Concentrator, the service road joining the Amandelbult Concentrator section and Dishaba and the Dishaba Mine itself and thus the soils described above were previously removed and separately stockpiled prior to development.

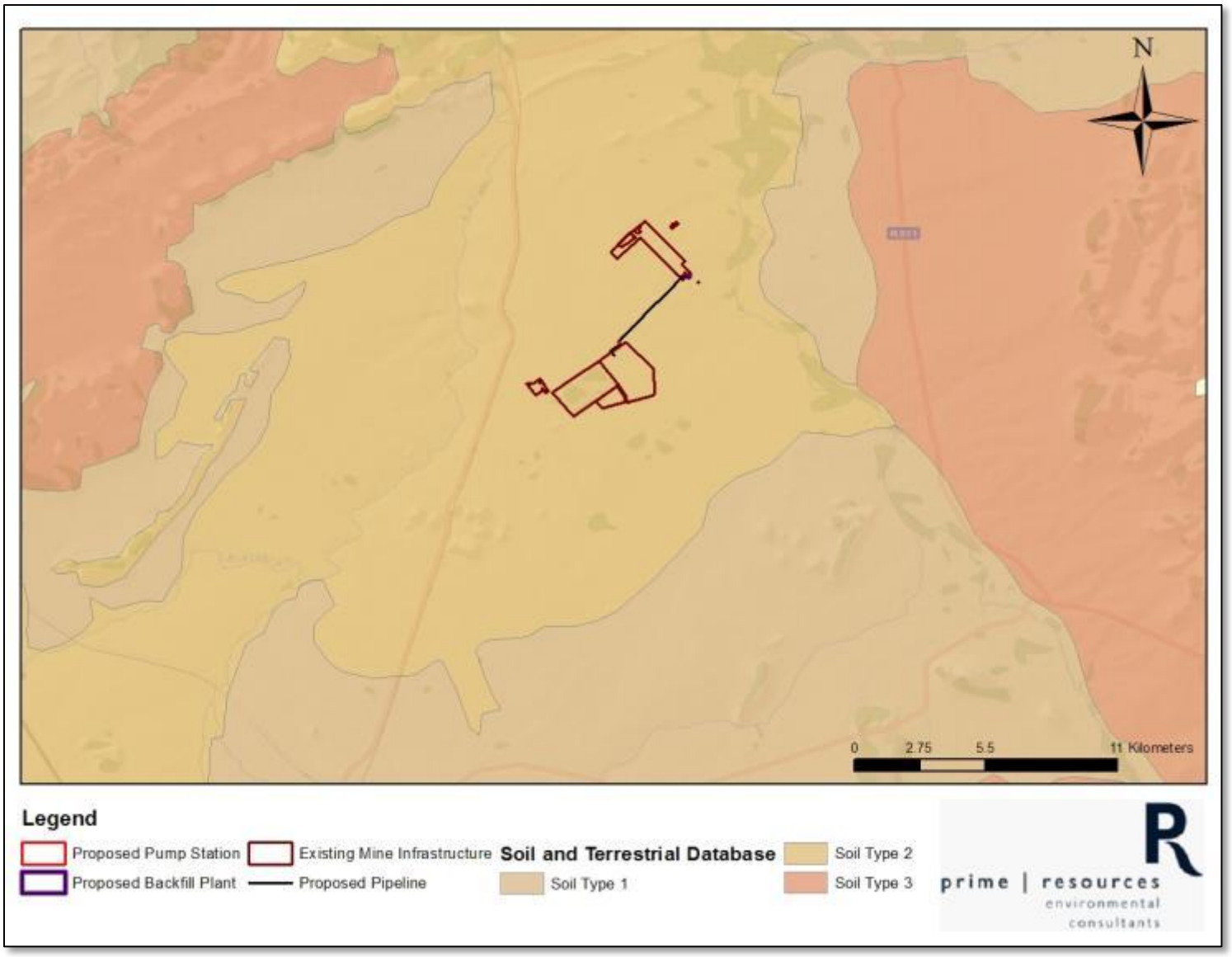


Figure 4: Soil types found within the Dishaba Backfill Project Area (SOTER, 2012).

3.6 Terrestrial Biodiversity

An Ecological Assessment was previously conducted at the Mine by Ecolife cc, during which the following was found associated with non-disturbed areas surrounding the project area.

3.6.1 Flora

The immediate region surrounding the Dishaba Mine is dominated by Turf Thornveld and mixed Bushveld of the Savannah Biome

Terrestrial Vegetation Units

The Savannah Biome is the largest biome in Southern Africa and is generally characterised by a grassy ground layer and a distinct upper layer of woody plants. Grassy layers tend to dominate due to the development of the woody layer being hampered by lack of sufficient rainfall coupled with fires and overgrazing.

Terrestrial Flora

The vegetation varies from dense, short bushveld to open-tree Savannah. On shallow soils *Combretum apiculatum, Acacia caffra, Dichrostachys, Cinerea lannea, Sclerocarya birrea* and *Grewia* species dominate. The more dominant grass species include: *Digitaria eriantha, Schmiditia pappophoroides, Anthephora pubescens, Stipagrostis uniplumis* and *Aristida* and *Eragrostis* species. On the deeper, more sandy soils, however, *Terminalia sericia*, *Ochna pulchra*, *Grewia flava*, *Peltrophorum africanum* and *Burkea africana* dominates the tree layer, with *Eragrostis pallens* and *Perotis patens* as the dominant grass species. The bushveld areas range from a poor to good veld, with grazing and fire pressure determining the structure of the vegetation. The area is associated with a wide variety of plant species from both the Turf Thornveld and Mixed Bushveld of the Savannah Biome.

3.6.2 Fauna

The aforementioned ecological study confirmed the presence of mammal species such as: black-backed jackal (*Canis mesomelas*), porcupine (*Hystix africaeaustralis*), vervet monkey (*Cercopithecus aethiops*), scrub hare (*Lepus saxatilis*), warthog (*Phacochoerus africanus*) and duiker (*Sylvicapra grimmia)* in non-disturbed areas surrounding the Dishaba Mine.

Direct and indirect observations in the past have confirmed the presence of centipedes, termites, butterflies, tapping beetles, rodents, snakes and lizards.

The proposed backfill project will be located immediately adjacent to the existing Dishaba Mine shaft as well as the servitude of the service road connecting the Dishaba Mine and the Amandelbult tailings impoundment and is therefore in an already disturbed area; however, the following species of conservation concern are associated with the greater local setting.

Scorpions

Scorpions have adapted in such a way that has allowed them to occur in virtually the full range of potential terrestrial habitats, with the preferable habitat being the savannah and rocky promontories of the area surrounding the Dishaba Mine.

Spiders

The undisturbed areas are considered habitat potentially suitable for trapdoor spiders and a number of other arachnid species

Amphibians

There are 109 species of frog that are currently listed as potentially occurring in the region, 22 of which are listed as threatened, two of which are endemic to the region. While habitats that are suitable do occur in the region, the habitat is considered marginal and not likely associated with the area disturbed by development of the Dishaba Mine.

Reptiles

Crag lizards are endemic to the Limpopo Province and may be found in undisturbed areas of the region.

Birds

The bird species of concern which were previously identified in the region are mostly dependant on open water, with a preference for marshlands, none of which are associated with the disturbed areas for the proposed backfill project at Dishaba.

3.7 Land Cover and Land Use

3.7.1 Regional Land-Use

The Dishaba Mine is located in the Limpopo Province of South Africa, the total area of the province is 13.8 million ha of which:

- Arable land accounts for 10 percent (7.3 percent being suitable for dry-land production and 1.1 percent for irrigation);
- Natural grazing (veld) for a further 67 percent;
- Forestry 0.9 percent; and
- 12.7 percent unclassified (including land not suitable for agriculture).

3.7.2 Local Land-Use and land cover

A. *The Backfill Pipeline*

The Dishaba Backfill Pipeline will be located within the service road servitude joining the Amandelbult TSFs with the Dishaba Mine. The pipeline, which is to be positioned approximately 5 m to the right of the service road, will be on plinths. A Photograph was taken at point 2 (indicated

in Figure 5) which displays a point along the proposed pipeline route. For the most part the pipeline route is comprised of undisturbed natural veld.

B. *The Backfill Plant*

The Photograph taken at point 3 in Figure 5 represents the proposed location of the Backfill Plant. As can be seen, the backfill plant will be located within an area of disturbed natural veld which is surrounded by the cleared footprint of the existing Dishaba Mine and its associated infrastructure.

C. *The Satellite Pump Station*

The satellite pump station will be located alongside the service road in close proximity to the Amandelbult TSFs, photographs taken at point 1 in Figure 5 represent the proposed location of the Satellite Pump Station. The satellite pump station will be developed in an area that is comprised of undisturbed natural veld. This natural veld area is surrounded by infrastructure associated with the Amandelbult TSFs.

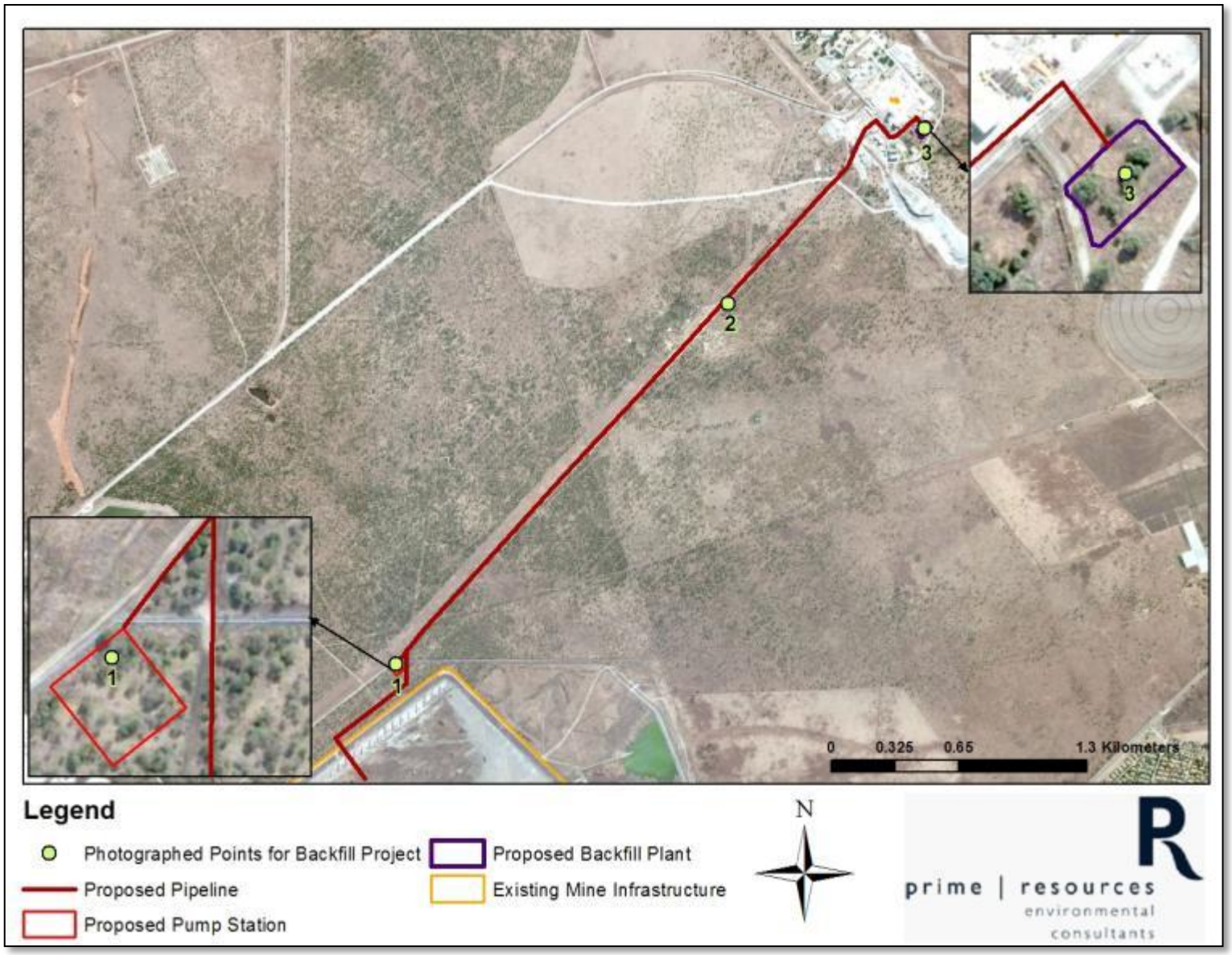


Figure 5: Photographed points at proposed backfill plant, pump station and pipeline.

Point 1: Proposed location of the Satellite Pump Station (northern extent), the area is comprised of undisturbed natural veld.

Point 1: Proposed location of the Satellite Pump Station (southern extent), the area is comprised of undisturbed natural veld.

Point 2: Disturbed natural veld area located alongside the service road (proposed pipeline route).

Point 3: Location of the proposed backfill plant, the area is comprised of disturbed natural veld.

3.8 Surface Water

The following information was obtained from the IWULA and other specialist work previously undertaken at the Dishaba Mine and the Amandelbult Concentrator / Services business units.

Two water courses traverse the project area, namely: the Bierspruit and the Crocodile River. The Bierspruit is situated to the west of the mining area and flows in a northerly direction where it then joins with the Crocodile River to the north. The Bierspruit is a non-perennial stream characterised by minimal flow between the months of May to October, there is a single tributary that feeds the Bierspruit River from the south east, and a second tributary ultimately dams several metres from the northern bank of the Bierspruit River.

The Crocodile River, situated in close proximity to the Dishaba Mine, is a perennial river situated to the east of the mining area where it flows in a north-westerly direction; because of the low relief of this area there is little surface drainage apart from two minor easterly flowing tributaries.

3.8.1 Catchments and Water Quality

The mining area is situated in the Crocodile-West Marico Water Management Area, and ultimately drains into the Limpopo River, designated by the DWA as Primary Drainage Region A; the responsible water authority being the DWA: North West Regional Office. The RPM falls over two quaternary catchment areas, namely: A24F and A24C. However, as can be seen in Figure 6, the Dishaba Mine Backfill Project is located entirely within the A24C quaternary catchment area.

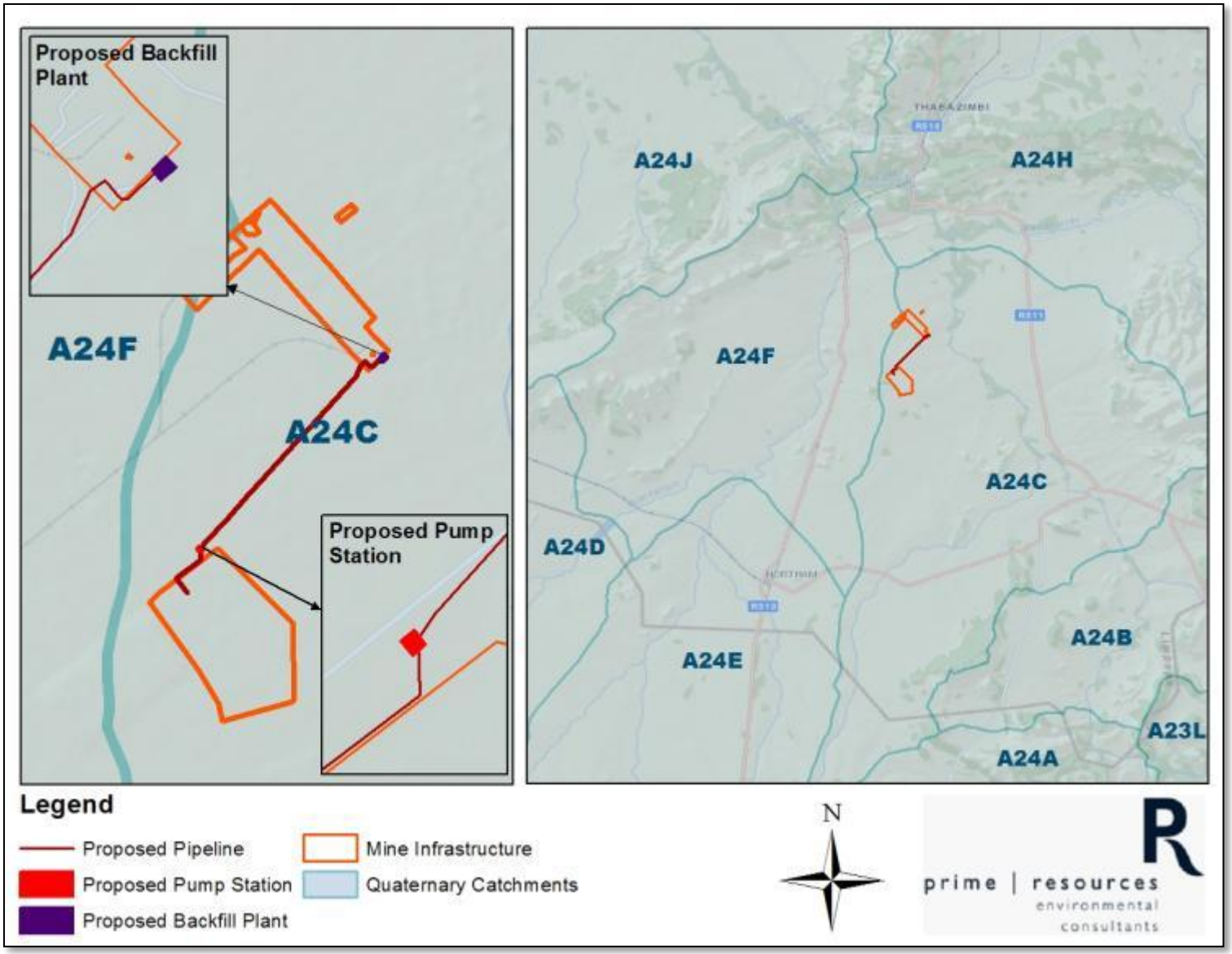


Figure 6: Map indicating the catchment boundaries relevant to the project area.

Water Quality

The non-perennial Bierspruit River is located approximately 2.8 km from the Amandelbult Concentrator, whereas the perennial Crocodile River is located approximately 1.8 km from Dishaba. The Bierspruit River is situated approximately 8 km away from Dishaba and thus bears little relevance to the Backfill Project.

In terms of surface water quality, sampling has historically taken place at both upstream and downstream localities on the Bierspruit and Crocodile Rivers. In both cases the upstream water quality can be regarded as the background for water flowing towards the Amandelbult Sections and Dishaba.

Water sampled to date from the upstream monitoring locations on the Crocodile River is generally of a good quality when compared to the DWA's water quality guidelines for domestic (tolerated) use. Constituents such as: Nitrate, Sulphate, Chloride, TDS (Total Dissolved Solids), Calcium, Potassium and Magnesium are all well within the DWA Target Water Quality Ranges (TWQR) as set out for domestic use. Electrical conductivity and total hardness are above the TWQR value and pH is slightly elevated. Similarly, the water sampled at the downstream locations of the Crocodile River is of an acceptable quality, when compared to the DWA's water quality guidelines for domestic (tolerated) use, albeit slightly elevated levels of Electrical Conductivity, Total Dissolved Solids and Hardness. The surface water quality has always been relatively constant between the upstream and downstream monitoring localities on the Crocodile River.

3.8.2 Conservation Status of Surface Water

According to the DWA and Council for Scientific and Industrial Research (CSIR), the Bierspruit and Crocodile Rivers are both considered to be endangered systems. This means that these ecosystems have lost significant amounts of their original natural habitat and their functioning is therefore compromised. In Figure 7 below the position of the Bierspruit and Crocodile Rivers, in relation to the proposed Dishaba backfill project is indicated.

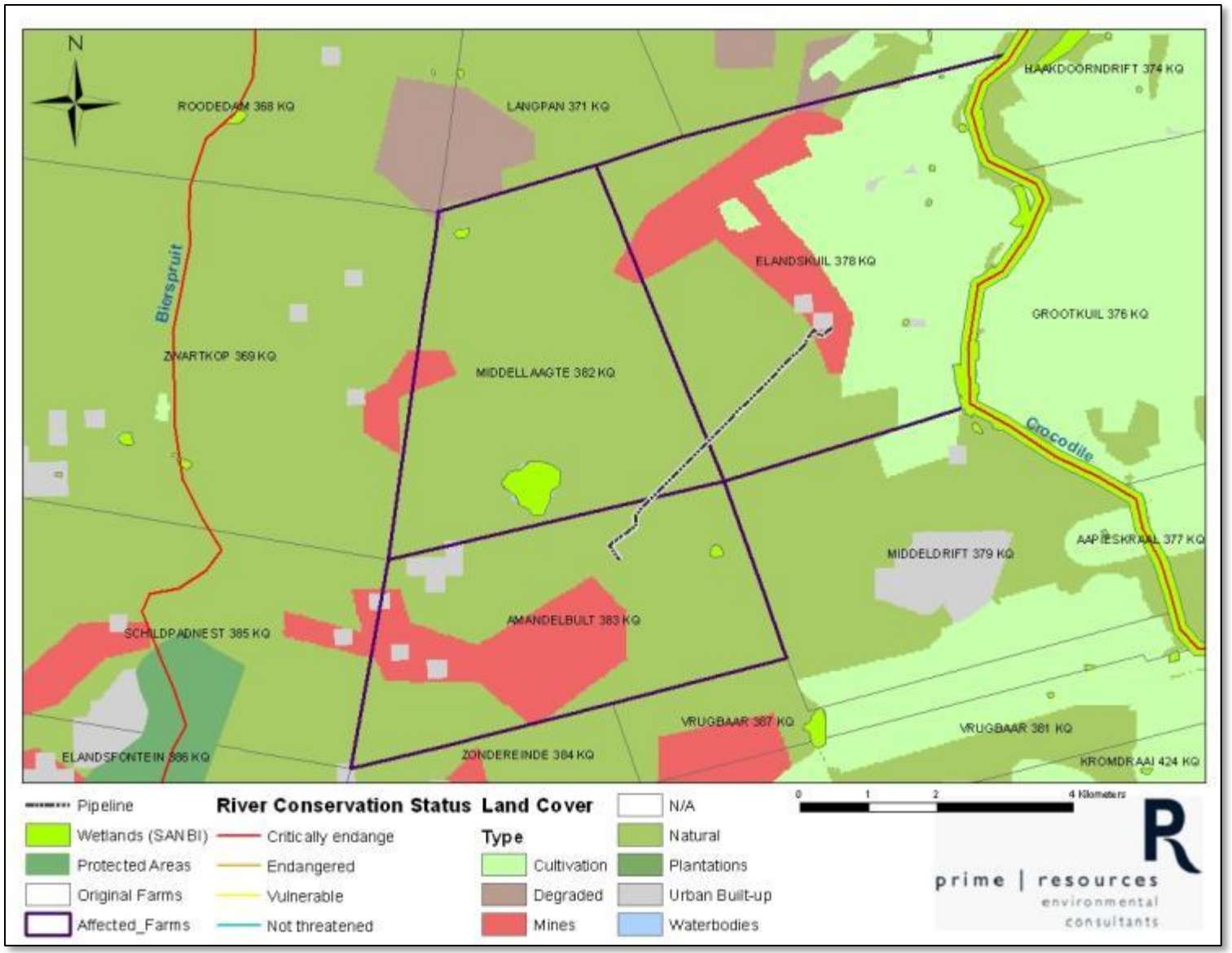


Figure 7: The position of the Bierspruit and Crocodile River and ecological sensitivity.

3.8.3 Drainage

The information in this section was taken from the existing IWULA discussed previously. The local drainage is characterised by natural drainage lines, artificial furrows and topographic depressions associated with minor surface undulation.

The Crocodile River meanders across relatively flat terrain. The low relief of this area results in little surface drainage (apart from two insignificant tributaries in close proximity to Dishaba). The Crocodile River is located approximately 2 km away from the Dishaba Shaft.

3.9 Wetlands

There are no wetlands identified in close proximity to the proposed project.

3.10 Groundwater

3.10.1 Aquifer classification

Minor aquifer systems occur over approximately 90% of the area between the Amandelbult concentrator plants and the Dishaba Mine. These aquifers do not have a significant inherent porosity and are thus not a primary source of groundwater.

Shallow aquifer

During periods of low rainfall, deep desiccation cracks in the montmorillonitic 'black turf' cover extend down to 1.5m below ground level (bgl) allowing surface flow to infiltrate the perched water table during heavy rainfall after a dry period. Surface infiltration may be reduced during wet months due to the hydrophilic nature of the inherent clay materials.

The groundwater flow direction in the shallow aquifer is from South to North, and the average seepage velocity is between 0.1 and 20m per annum. Recharge to the groundwater regime is estimated to be at 3% of the MAP.

Fractured rock aquifer

Ultramafic intrusive rocks of the BIC underlie the project area beneath the 'black turf' cover. Fractured contact zones between crystalline rocks in this zone generally have high groundwater potential, in general good borehole yields are derived from these aquifers. Aquifers in the Rustenburg Layered Suite (RLS) do not allow lateral flow of groundwater and the fractured rock aquifer is thus heavily compartmentalised.

3.10.2 Groundwater quality

The following information was gathered from results of the ongoing groundwater monitoring programme at Dishaba and the Amandelbult Tailings / Services Sections.

Groundwater Quality associated with the Amandelbult Tailings Impoundments and Concentrator Plants

The underlying Geology may have a significant influence on the groundwater quality. Total Dissolved Solids (TDS) is a good indicator of the overall inorganic quality of the groundwater because it provides a measurement of the total amount / mass of salts that are in solution. TDS concentrations associated with the Amandelbult TSFs are largely within the ideal and recommended ranges for domestic use with averages varying between 210 and 2 360 mg/l.

Sulphate concentrations mostly vary between 1 and 450 mg/l, which is within the ideal to recommended limits (according to the DWA's guidelines for domestic use-tolerated), aside from some excessive instances where averages vary between 680 and 1 320 mg/l.

Some sodium enrichment is noted, where concentrations vary between 20 and 360 mg/l.

When compared to the DWA's guidelines for domestic use the nitrate concentrations measured are well within the ideal range, with averages varying between 0.03 and 6 mg/l.

The groundwater chloride concentrations exceeded the maximum permissible concentrations (according to the DWA's guidelines for domestic use), in some instances, with concentrations averaging 870 and 1 670 mg/l respectively. Generally, however, chloride concentrations fell within the ideal ranges for domestic use as specified by the DWA.

The following conclusions may be drawn:

- The tailings complex may be considered to be the most significant influence on groundwater quality;
- Groundwater quality varies significantly as a result of aquifer heterogeneity; and
- Down-gradient groundwater quality appears unaffected by the current mining activities.

Groundwater Quality associated with the Dishaba Mine

Groundwater sulphate, nitrate, chloride, sodium and TDS concentrations recorded at Dishaba fall well within the recommended limits for domestic use as set out by the DWA, aside from a slightly increasing sulphate, chloride and sodium concentration.

The following conclusions may be drawn:

- Overall groundwater quality within the Crocodile River drainage direction appears to be unaffected by the current platinum mining activities;
- Elevated nitrate concentrations are more often than not associated with the usage of nitrate based explosives, and are therefore expected to originate from shaft areas.

3.11 Archaeology

The following information was taken from a specialist study done by the National Cultural History Museum.

Research conducted previously at the Amandelbult and Dishaba sections indicated that there are a large number of sites of archaeological interest in the greater project area, with the majority of previous settlements having inhabited the area in the past being located close to the Bierspruit River. The surveys did not find any Early Stone Age tools in the area; this could be due to the fact that the area is somewhat inhospitable.

People started to occupy areas previously considered inhospitable during the Middle Stone Age (MSA), as such artefacts dating from this period were found in the area. A number of artefacts dating to the Late Stone Age were identified, though fewer in number when compared to the amount of MSA artefacts found.

Two sites could possibly date back to the early Iron Age, however not much can be said about them as the particular occurrences are small in size with very limited pottery. At about 1820 the Kwena ba Phalane were settled on the western bank of the Crocodile River, subsequently the Kgatla baga Kgafela settled in various areas around Dishaba Mine.

Archeologically speaking, the study area is not an area of high significance; this can be attributed to environmental constraints that hampered the settlement of the area in the past. According to the previous studies, no archaeological sites will be affected by the proposed infrastructure to be developed, however, management measures will be put in place should previously unknown artefacts be uncovered during the development process.

3.12 Air Quality

The project area is characteristically dry and evaporation rates are very high; it is for this reason that environmental dust is an inherent property of the natural environment of the area

The results from dust fallout monitoring at the Dishaba Mine indicate that 'nuisance dust' is not of any special significance, with all results obtained within the acceptable limits and can be classified as low (80% within 'Residential standards') in terms of SANS 1929:2005. Larger particle size of the nuisance dust means that the particles are inclined to fall out relatively close to the source (within a few hundred meters).

3.13 Noise

The proposed backfill pipeline and satellite pump station are to be located in areas comprised of natural veld. These rural areas are typically quiet; therefore, ambient noise levels will not (typically) exceed 45 dBA (A-weighted decibels) during the day and 35 dBA at night. Areas in closer proximity to the Dishaba Shaft, such as the proposed location of the Backfill plant, will be characterised by slightly elevated ambient noise levels (which may exceed 45dBA) due to industrial noises emanating from the Dishaba Shaft.

3.14 Socio- Economic

The *Thabazimbi Municipality Integrated Development Plan* discusses the socio-economic structure of the region in which the Dishaba Mine is located, as well as from baseline information contained in the existing social documentation for the Tumela and Dishaba Mines and the Amandelbult Concentrator and Services, namely the Socio-Economic Assessment Toolkit and the 2011 Community Engagement Plan.

3.14.1 Key Stakeholders

The Amandelbult Community Engagement Plan, 2011 lists the following stakeholders which form part of the Community Engagement Forum the Tumela and Dishaba Mines as well as the Amandelbult Concentrator and Services as follows:

Stakeholder category	Stakeholder
Waterberg District Municipality	Executive Mayor
	Municipal Officials
Thabazimbi Local Municipality	Executive Mayor
	Municipal Officials
	Ward councillors
Moses Kotane Municipality	Mayor
	Municipal officials
	IDP Representative Forum
	Ramokoka Stad
	Ramaphotoka – War Councillor
Neighbouring communities	Residents of Thabazimbi
	Residents of Mogwase township
	Residents of Moruleng township
	Residents of Mantserre Village
	Residents of Manamakgoteng Village
	Residents of Northam
	Residents of Smashblock
Farmers	Neighbouring farmers
National Government Regional Offices	Department of Labour
	Department of Mineral Resources
	Department of Rural Development and Land Reform
Provincial Government Departments	Department of Health and Social Development
	Department of Education
	Department of Economic Development, Environment and Tourism
	Department of Agriculture
Organised business and business alliances	Tourism agency
Local media	Thaba FM
Community development partners	Sivukile
	Thuso ya Batho Anti-Crime

Key strategic suppliers	ESKOM: Thabazimbi Regional Office

3.14.2 Surrounding Communities

The Amandelbult Community Engagement Plan, 2011, defines the following communities which are situated around the Tumela and Dishaba Mines, Amandelbult Concentrator and Services (Figure 8) and which further summarises the primary concerns previously raised by the communities regarding mining activity at the various mining areas:

Community	Approximate distance from Dishaba Mine Backfill Plant (km)	Previous concerns and issues raised
Mantserre	36.08	▪ Expectations for preferential treatment in so far as community development, employment and procurement is concerned. ▪ Minimum support from Moses Kotane Municipality because the municipality believes it is the mine's responsibility to support the community.
Northam	24.10	▪ Recruitment cluster to be separate from Thabazimbi. ▪ Migrant labourers invasion of property.
Retabile	20.16	▪ Poor socio-economic conditions. ▪ Development of further informal settlements.
Thabazimbi	18.90	▪ Expectations for business opportunities at the mine. ▪ Low skills levels and lack of business acumen. ▪ Lack of leadership in the municipality. ▪ Unemployment and recruitment cluster marred with corruption.
Smash Block	11.25	▪ Poor socio-economic conditions. ▪ Development of further informal settlements.

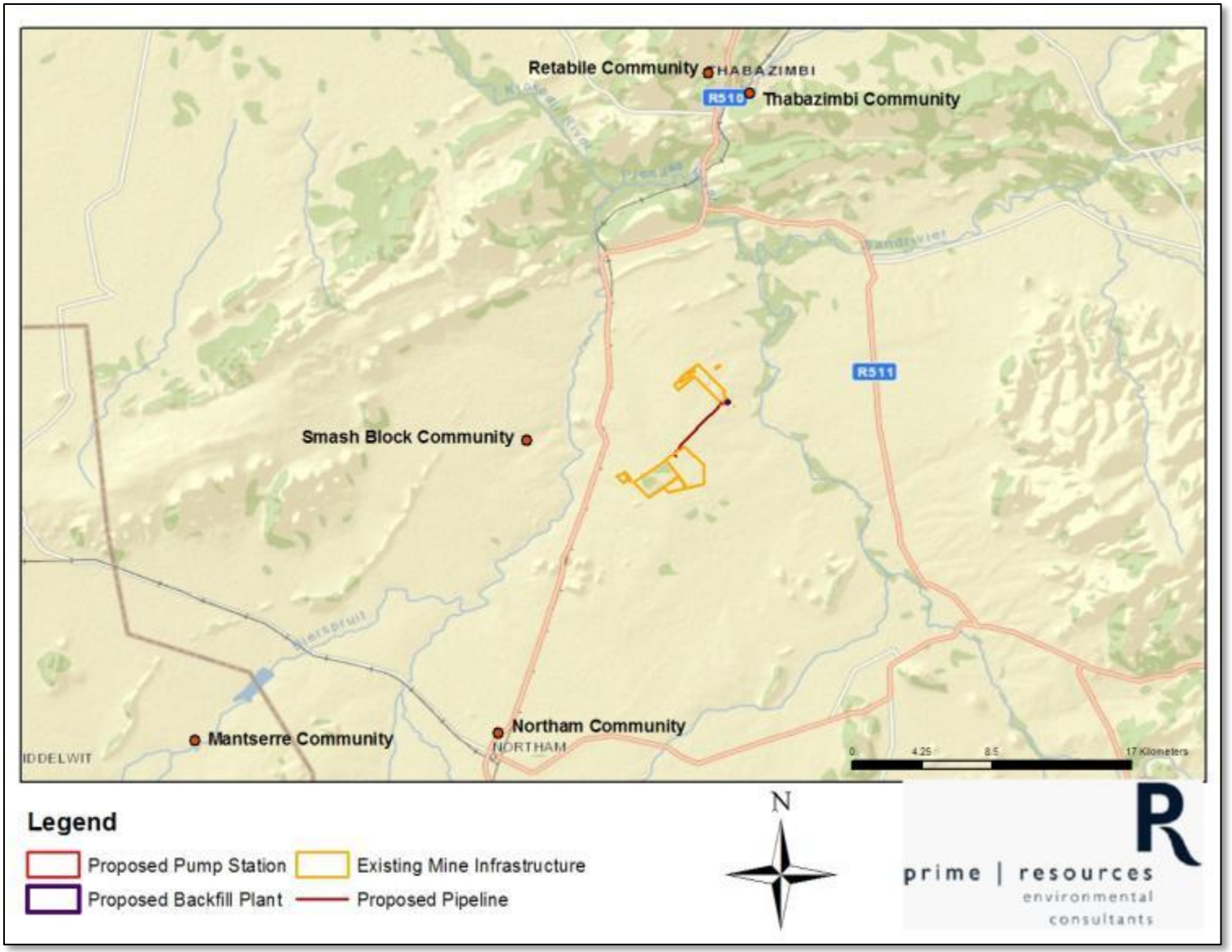


Figure 8: Communities surrounding Dishaba Mine (Amandelbult Community Engagement Plan, 2011)

The following plans have been implemented to address issues and concerns raised by these communities;

Issue	Response
Prioritise employment of the local community.	The mine has established recruitment clusters in various municipal wards within a 50km radius to recruit local people and young people in particular. The mine only recruits outside of the area of operation for scarce skills.
Procurement: the mine needs to offer opportunities to local and SMMEs businesses first.	The mine collaborates with business development agencies to support local SMMEs. The mine will introduce measures to increase the opportunities available to local suppliers.
Local Economic Development.	The mine will strengthen relationships with municipalities and participate in LED and IDP forums.
Skills Development in local communities.	The mine is aware of the skills challenges in the area. 48 youths completed construction-related skills training through Prime Serve in 2007 which was funded by the mine. 22 of them were successfully recruited by the mine.
Improve communication with local communities.	The mine communicates with stakeholders through local forums and has developed a stakeholder engagement plan to enhance communication activities.

3.14.3 Population demographics

The mid-year population estimates, in 2011, for the Limpopo Province was 5,439,600 people. In 2007 approximately 60,038 people were living in the Thabazimbi Municipality area. Between a census done in 2001 and a community survey done in 2007, the Thabazimbi Municipality area experienced a population growth rate of 4.9%. In 2007 the Limpopo province had an averge population density of 60 people per km^2.

The most common languages spoken in the Limpopo Province are Sepedi, Xitsonga and Tshivenda. The province is characterised by a high dependency ration due to the fact that 41.3% of the population is between the ages of 5 and 14. In terms of education, approximately 6.5% of the population of the Thabazimbi Municipality reported as having no schooling, 9.8% of the population have attained grade 12 and 2.8% of the population have received some form of post-school education.

3.14.4 Major economic activities and employment statistics

Only 51% of the economically active population were employed in 2007. The most significant employer in the Thabazimbi Municpal Area is the mining sector (68.7% with a 7.8% increase average per annum) which has made substantial contributions to in-migration. Other sectors that are responsible for employment in the municipal area include: agriculture (8.3%), households (4.9%), and community services (3.6%). The Municipal area experienced an average decrease in unemployment of 1.5%. An estimated 10.3% of people in the Municipal area who are

economically active are unemployed, which can be attributed to a lack of employment opportunities and / or lack of relevant skills.

In terms of employment, a great challenge that the municipality faces is the fact that most of the mines in the area are mature and are nearing the end of life, which will have implications for future employment rates.

3.14.5 Workforce demographics

The majority of employees at the Dishaba Mine originate from the Moses Kotane (30.5%) and the Thabazimbi (19.5%) Municipalities. More specifically labour is drawn from the following villages which surround the mine:

- Ramokokastad;
- Kraalkoek;
- Rhenosterkraal;
- Manamakgotheng;
- Sandfontein;
- Modderkuil;
- Mogwase;
- Magong;
- Mononono;
- Kameelboom;
- Motlhabe;
- Mokgalwaneng;
- Mantserre;
- Welgeval;
- Thabazimbi;
- Regorogile;
- Northam and Koedoeskop; and
- Smashblock (formely known as Schilpadsnest).

3.14.6 Social infrastructure provided by the municipality

Education facilities

According to the 2012 / 2013 IDP for the Thabazimbi Municipality, there are: 30 pre-schools / crèches, 25 Primary schools, 4 combined schools, 4 high schools and 4 private schools located within the Thabazimbi Municipal Area.

Health care facilities

Within the Thabazimbi Municipality there are: 5 hospitals, 10 clinics, 3 mobile clinics and 3 satellite clinic offices.

Water supply

The number of households with their water supply within the Thabazimbi Municipality (for 2007) is indicated in Table 5.

Table 5: Water sources and number of households in the Thabazimbi Municipality in 2007.

WATER SOURCES	NUMBER OF HOUSEHOLDS	PERCENTAGE OF HOUSEHOLDS
Piped water inside dwelling	10 624	44.5
Piped water inside the yard	6 281	26.3
Piped water from access point outside the yard	5 064	21.2
Borehole	868	3.6
Dam / pool	44	0.2
Water vendor	953	4.0
Total	**23 872**	**100**

In the 2012 / 2013 Integrated Development Plan (IDP) for the Thabazimbi Municipality, some areas were identified as facing challenges that need to be addressed regarding sanitation and water. A shortage of potable water and groundwater, especially during summer, are major challenges that are being faced at present. Bulk water is imported from the Magalies Water Scheme; however, this source is not adequate during summer months. Infrastructure is needed to increase the water supply to meet the current water demand.

To address the water shortages the Thabazimbi Municipality has commenced with the construction of a bulk water supply pipeline between Zand Rivierspruit and Rooiberg, this pipeline is currently 97% complete. Due to a lack of service coverage by the municipality approximately 3,660 households are experiencing water backlogs.

Sanitation

Table 6 indicates the number of households that had access to sanitation facilities in the Thabazimbi Municipality in 2007:

Table 6: Number of households by access to sanitation facilities in the Thabazimbi Municipal area.

SANITATION FACILITIES	NUMBER OF HOUSEHOLDS	PERCENTAGE OF HOUSEHOLDS
Flush toilets (connected to a sewerage system)	16 646	69.7
Flush Toilet (with septic tank)	99	0.4
Dry toilet facility	772	3.2
Pit toilet with Ventilation (VIP)	135	0.6
Pit toilet without Ventilation	5 075	21.3
Chemical toilets	44	0.2
None	1 100	4.6
Total	23 872	100

According to the Thabazimbi Municipality IDP 2012 / 2013, 6 946 households had no access to sanitation facilities in 2009.

Electricity Infrastructure

Table 7 shows the number of households that utilise each power source (this shows that only 68.87% of the population use electricity).

Table 7: Number of households by access to power sources in the Thabazimbi Municipal area.

POWER SOURCE	NUMBER OF HOUSEHOLDS	PERCENTAGE OF HOUSEHOLDS
Electricity	13 575 56.87	56.87
Gas	123 0.52	0.52
Paraffin	717 3.0	3.0
Wood	854 3.58	3.58
Coal	15 0.06	0.06
Other	8 587 35.97	35.97
Total	23 872 100	100

According to the Thabazimbi Municipality IDP 2012 / 2013, the number of households with no electricity connections decreased from 245 in 2007 to 94 in 2008.

3.14.7 Social Infrastructure Provided by Mines in the Area

In addition to the social infrastructure provided by the Thabazimbi Municipality, the mines within the area provide social infrastructure, such as:

- Mine housing facilities and hostels;
- Sport and recreational facilities, and most of the mining communities have community halls at their disposal for in-house sports and recreational activities;
- Mine hospitals and sickbay facilities. The Rustenburg Platinum Mines have hospitals which contain 48 to 154 registered beds;
- Commodities and services are also available on the mine properties, such as: shopping centre, post office, supermarket, clothing store, bank, library, chemist and fuel station.

3.14.8 Dishaba Mine's Contribution to Local Economic Development

Education

- Computer centres in local Schools: Computer centres have been established in local schools such as Mabogo-Pedi High, Groenvlei Secondary, Naletsana Secondary, Ysterberg Primary, Northam Comprehensive High and Krause Primary schools through the Anglo American Chairman's fund.
- English classes: A five year funding agreement has been made with Frikkie Meyer High School in order to develop English classes in this formerly Afrikaans only school. This

intervention has allowed for the admission of black students and English speaking students.

- Learner Development Plan: Invested in the development of primary school learners in the fields of maths, science and technology. The schools supported in the Thabazimbi Local Municipality are Krause Primary, Chrome Mine Primary, Ysterberg Primary, Deo Gloria Primary, Northam Primary, Thekganang Primary and Naletsana Secondary. In the Moses Kotane Local Municipality the schools supported were Mochine Primary and Modibeng primary. Over 4000 learners benefit from this programme.
- Educator Development Programme: Educators are given the necessary training, support, mentoring and coaching to teach the abovementioned fields of study.
- Mabogo-Pedi library: The library of Mabogo-Pedi High School was upgraded; this was done by installing new shelves and providing a new copier machine.
- New classrooms for Chrome Mine Primary: Partnership was entered into with the Limpopo Education Department to construct eight new classrooms. The work also involved the construction of a new toilet block, a new kitchen and a new water tank.
- Sanitation facilities for Letswai Metsi Primary School: Provided toilet facilities for the school.
- Renovation of schools: The development projects at Mantserre included the renovation of Modise, Mmamodimakwana and Mantresse Schools. Renovations to Modise High School's three classroom blocks have recently been completed.

Community Infrastructure, health and wellness

- Sivukele NGO: Partnered with Sivukile to provide education and home care interventions in the community.
- Support for town planning: The municipality received financial support from the mines over a three year period for the appointment of a town planner.
- Spatial Development Framework: The municipality received funding for the development of Thabazimbi's Spatial Development Strategy.
- Water provisions for the Rooiberg community: Contributed funds for the construction of a water pipeline and reservoir to supply the community of Rooiberg with potable water.
- Community hall, tribal office and high mast lights: Supporting various development projects in Mantserre Village in the Moses Kotane Local Municipality a hall (with seating for a thousand, computer and library centre and tribal offices are being constructed. The project also involves the installation of high mast lights for the area. This project has created 93 jobs for local people who receive on-site training.

4 DESCRIPTION OF THE PROPOSED DEVELOPMENT

Refer to Appendix 1 for a copy of the site plan for the proposed Dishaba Backfill project development.

4.1 Introduction

In 2004, it was found that strike pillars were punching the hanging wall in the Merensky sections of the Dishaba Mine underground workings. As a result it was deemed necessary to introduce backfill for better distribution of potentially damaging mining induced stress, so as to allow for the successful continuation of mining. Backfilling will also reduce stress concentrations when the secondary reef is mined.

4.2 Backfill Project

The requirement of the pilot plant is approximately 560 m^3 per day of backfill to the underground workings, a process which will entail the following:

4.2.1 Satellite Pump Station

A remote satellite pump station will be constructed in close proximity to the existing TSF complex (located in close proximity the Amandelbult Concentrator Plants, approximately 4km away from the Dishaba Mine). This pump station will comprise a storage facility consisting of two 1000m^3 storage tanks, of two-days capacity, which will be fed by drawing off from the existing tailings delivery pipeline from the Amandelbult Concentrator.

4.2.2 Pipeline

A 200 Nominal Bore (NB), above-ground pipeline will be installed to deliver tailings from the satellite pump station to the Dishaba shaft complex within the existing service road servitude connecting the Amandelbult TSFs and Dishaba Mine over a distance of approximately 4km and upon plinths situated 5-10m away from the actual road surface.

Return water from the backfill process will be used to flush the pipeline back to the tailings facility. More details in this regard are contained in the water balance discussion below.

4.2.3 Backfill Plant

The tailings delivery pipeline will end in a 1000m^3 storage tank at a new backfill plant that is to be constructed within the existing Dishaba Mine shaft complex.

Stored tailings will then enter a thickener circuit for water recovery, with the underflow thereof blended with a binding agent. The binding agent serves to aggregate and stabilise the tailings as well as to render the mixture inert. The binding agent to be utilised will either be Ordinary

Portland Cement (OPC) or Minova Fillset stored in three silos with a combined storage capacity of 264m^3. Neither of these substances or their constituents are classified as dangerous in terms of SANS10234.

The dry binder is screw-fed from the cement storage silos into a twin shaft mixer, which will mix the thickened tailings, binder and make-up water into a homogenous backfill mixture.

Cemented backfill will be then be fed into a backfill buffer tank from the mixer. Backfill buffer pumps will draw cemented backfill on a continuous basis from the buffer tank and pump it into a delivery tank situated in close proximity to the No 2 shaft.

4.2.4 Backfilling

Cemented backfill from the delivery tank will be gravity fed in an 100 NB piping system at a flow rate of approximately 25m^3/hour to the target backfill panel underground where an accelerant (sodium silicate, OPC, Fillgel for Minova Fillset or calcium chloride) will be added as a catalyst for the setting process.

The accelerant will be pumped from two storage tanks on surface to two underground 1 000L storage tanks. Accelerator pumps situated underground will then draw accelerator from the underground storage tanks and pump it to the required backfill panel where it will be added to the cemented backfill, with the mixture being utilised to fill bags employed to mould into the shape of the backfill panels. The cemented backfill will be completely cemented (dry, inert mixture) within 28-days from first backfill.

4.3 Water Balance

One cubic meter of backfill contains a certain percentage of solids and water - the amount of water contained in one cubic meter of backfill depends on the composition of the tailings material, this will ultimately influence the binder content (water: cement ratio) to be added to achieve the required backfill strength.

During the Backfill Project, 4.8 to 5m^3 of thickened tailings is batch fed to a backfill weigh hopper. Dry binder is then screw fed from two storage silos and is then discharged into a binder weigh hopper. Subsequently, batches of thickened tailings and binder are accurately measured before being fed to a twin shaft mixer; make-up water will be fed into the twin shaft mixer to achieve a set density. The mixer system produces approximately 5.8m^3 of backfill per batch which is subsequently pumped to a backfill shaft tank before being gravity fed down the Dishaba shaft.

Five backfill panels are to be filled per day; the nominal flow rate per pipeline is 25m^3 / hour. Each backfill pipeline needs to be flushed twice, once before and once after the depositing of backfill into the panels.

Water and Flocculent System

During the backfill process thickener overflow water reports to the process water tank. Flush and dilution water pumps draw water from the process water tank for delivery to the required areas in

the backfill plant. Any additional water required is sourced from the process plant. Potable water is sourced from the process plant and is fed into the potable water tank. Potable water is used for Gland Service Water (GSW), make-up water and flocculent mixing.

Process water and potable water systems

Flush water pumps will draw water from the process water tank and deliver flush water (at a rate of 348 m^3 / hour) to the required areas in the backfill plant. Dilution water pumps will draw water from the process water tank and will subsequently deliver dilution water to the thickener feed and backfill holding tanks (at a rate of 90 m^3 / hour). Potable water pumps will draw water from the potable water tank (at a rate of 31.2 m^3 / hour) which will subsequently be delivered via a pressurising ring main. GSW pumps will draw water from the potable water tank and will subsequently deliver to the GSW and flocculent systems via a ring main (at a rate of 4.4 m^3 / hour).

The following results are observed from the water balance:

- Milled tailings is fed to the backfill plant at an average rate of 13 349 t / month;
- The process plant supplies 3.15 to 3.50 ML potable water to the backfill plant every month;
- Based on a total 30 minute flushing time per pipeline, the total excess water deposited underground per month is 1.6 ML (enters the underground Return Water Circuit for re-use);
- The backfill plant produces excess process water of 10.1 to 19.9 ML / month (based on a feed density to the backfill plant of 1.4 t / m^3).

4.3.1 Clean and Dirty Water Handling

Clean water

Provision has been made to keep all possible clean water arising as stormwater runoff within the receiving catchment by promoting clean storm water runoff to the receiving catchment and keeping this separated from the dirty water catchment. A concrete, clean water cut-off drain at the Backfill Plant will be provided to divert clean water to the receiving catchment.

Dirty water

It should be noted that once tailings have been drawn-off from the existing tailings feed, the process remains in a closed circuit (including the delivery pipeline), with all storage silos (including cement, tailings and accelerant) comprising concrete / steel tanks. These tanks are designed to contain the operational capacity plus some excess, while the backfill plant area will contain bunds to receive any spillage that may occur. All spillage contained in the bunded areas will drain to sumps which will be pumped to the emergency backfill deposition paddock discussed further below.

An excess backfill emergency deposition paddock will be developed in close proximity to the No. 2 shaft. This PCD will be a concrete facility designed to accommodate a 1:50 year return event plus normal operational capacity, with 0.8m of freeboard. The purpose of this facility is to provide an

area where a batch of cemented backfill cannot be fed underground and needs to be disposed of before the material in the pipeline system dries. Material in such an emergency situation will be disposed of to the paddock on surface and allowed to dry. The dry material will then be removed to the Amandelbult TSF.

5 PROJECT ALTERNATIVES

5.1 Introduction

The objective of this section is to identify any feasible alternative locations for the proposed pipeline, alternative option for underground support, as well as delivering the backfill to the plant, and lastly land use alternatives for the proposed Project area.

5.2 Alternative Locations / Techniques

The proposed backfill pipeline must deliver tailings from the existing Amandelbult TSFs and thus location alternatives are limited. The proposed pipeline is located on an existing servitude, thus this is the optimal position to place the pipeline as this servitude is the most direct route between Dishaba and the Amandelbult TSFs. Additionally, the proposed pipeline will not cross any rivers or sensitive environments.

The backfill plant itself is to be developed on surface within close proximity to the target underground panels. The optimal position for this is thus in close proximity to the Dishaba Mine. The existing area between the settling dams and the sewage plant was selected as the target area for development as the area is already disturbed.

In terms of the technology, the backfill technique has never been used as a support medium in a shallow Platinum mine with a sub-horizontal tubular ore body. The alternative technique that may be used for shaft stabilisation is the use of support pillars (which is the system currently utilised); however, the 3m x 3m pillars that are currently being used are punching through the reef, resulting in a mushroom effect. Punching can be reduced by increasing the size of the support pillars; however, this would reduce the extraction rate (which is currently at 50%) even further. In this particular case backfilling is thus considered to be the only feasible technology for panel support (without sterilising resource extraction).

The backfill plant is situated in an area utilised for mining activities and there will thus not be any alternate land use. While the pipeline traverses and area where the land use is classed as natural, the route is along a servitude utilised for service provision to Dishaba and development therein will further not affect the land use. The land use at the position for installation of the satellite pump station is classified as natural and is situated within the reserve utilised for the Anglo Game Farm. The area selected, however, falls within the elbow bend of an aboveground pipeline. As discussed further below, an ecological specialist study will be commissioned to classify the proposed area for development so that any potential impacts thereto can be mitigated accordingly.

5.3 No Project' Alternative

Should the proposed backfill project at the Dishaba Mine not be implemented, the strike pillars will continue to punch the highwall in the Merensky sections, which will potentially induce further damaging mining stresses, and will ultimately render the underground workings unstable to the

point that mining operations would have to cease (due to the fact that it would be considered unsafe to continue mining). The Backfill Project is thus essential for the continuation of mining activities in the Dishaba Mine.

6 MOTIVATION FOR THE PROPOSED PROJECT

6.1 Benefits of the Project

The continuation of mining will allow for the continued extraction of PGMs which will make substantial contributions to the local and National economy. Further economic benefits of the project pertain to the continued provision of employment at the Dishaba Mine.

6.2 Disadvantages

As described above, the failure to implement a strategy such as backfilling to mitigate mining stresses leading to unstable mining conditions would result in the premature closure of sections of the Dishaba Mine. This would result in possible retrenchments (downsizing the mine) which would have negative spin-off effects on the local communities.

Further to the above, the disadvantages of the proposed development pertain to the potential impacts identified and discussed further in Section 8 below.

7 PUBLIC PARTICIPATION

7.1 Introduction

This Chapter details the public participation process that will be followed for the proposed Backfill Project at the Dishaba Mine. The public participation process is designed to provide the authorities, stakeholders, surrounding communities and any other IAPs (Interested and Affected Parties) with information about the proposed project and allow them the opportunity to comment, raise any interests, concerns or comments, to be registered on IAPs' database for the proposed project, or request additional information.

7.2 Scoping Phase Public Participation Process

7.2.1 Identification of Landowners and Stakeholders

As the proposed project is located within the existing RPM surface tenure and mineral right area, the landowner identified is RPM and no land claim disputes apply.

Although the project is situated within the existing Dishaba mine footprint and is at least 2km from any nearby and surrounding communities, it is proposed that the Amplats' Community Engagement Department (CED) at the Dishaba Mine be engaged so that the local community engagement forum can be notified of the proposed project during one of their regular meetings at the mine. IAPs can further register on the database of IAPs through the mechanisms described in Section 7.3.

7.2.2 Identification of Authorities

The authorities as listed below will be notified of the proposed project and invited to become involved in the process;

- Department of Mineral Resources (DMR);
- Department of Water Affairs (DWA);
- Limpopo Department of Economic Development, Environment and Tourism (LDEDET);
- South African Heritage Resource Agency (SAHRA) - Limpopo Office;

7.3 Scoping Phase Public Participation Process for the Proposed Dishaba Backfill Project

Below is a summary of the consultation to be undertaken as part of this Scoping Phase. This process will be in line with the MPRDA and NEMA requirements, the DMR Consultation Guidelines, and Anglo's/Amplats' internal stakeholder consultation criteria.

7.3.1 Background Information Document

A Background Information Document (BID) briefly describes the background to the project, the proposal in brief, the environmental process, and the contact details of whom to contact should queries arise. The BID will be distributed via Amplats' CED and then will further be made available to all IAPs requesting further information, as well as to authorities. The BID will be published in both English and Setswana.

7.3.2 Media notices

A media notice, which gives a brief description of the proposed project, the environmental process to be followed, details of applicable legislation, as well as contact details for the Environmental Assessment Practitioner (EAP), where further information can be obtained, the availability of a draft scoping report for comment and commenting periods will be published in English and Setswana (most common language in the Thabazimbi Municipality) in a local newspaper publication, Die Kwêvoël.

7.3.3 Site notices

Site notices describing the proposed backfill project will be published in both English and Setswana and posted up for display at the entrance to Dishaba, at the site notice board and at the access gate to the pipeline servitude. The site notices will provide contact details to allow all IAPs the opportunity to raise queries and concerns and find out further details regarding what the proposed activities will entail. Details will also be given of the environmental process to be followed and notify IAPs of the availability of the draft scoping report for comment. Deadlines for the submission of comments will also be indicated.

7.3.4 Commenting period

The commenting period will commence once the media and site notices have been published. The media notice, site notices and BID all provide information on how to contact the independent environmental consultants, and indicate that comments should be sent before the end of the commenting period. The commenting period will provide IAPs with 40 days during which any comments, concerns, issues and requests for more information can be raised through registration on the IAP database.

In addition, in line with the requirements for disclosure of all relevant project related information, the draft scoping report will be made available for comment at the local library and potentially at the Dishaba Mine offices, as well as on the Prime Resources' website. The draft scoping report will be made available for a period of 40 days during which stakeholders and IAPs have the opportunity to review the documentation and provide comments to the independent environmental consultant.

After 40 days, the draft scoping report will be revised to include any comments, issues or queries received during the commenting period. This revised scoping report will be made available for a

further 21-day commenting period to all registered IAPs, after which the final Scoping Report will be submitted to the DMR and LEDET for consideration.

7.3.5 Comments and issues table

All comments, issues and queries noted during the scoping phase consultation will be captured in a database as well as any responses made. At the scoping stage, the issues trail will be utilised to inform the investigations to be conducted during the EIA / EMP. This database will be continually updated throughout the environmental process.

7.4 Assessment Phase Public Consultation

Public Consultation will continue during the assessment phase. The draft EIA / EMP will be made available to all registered IAPs for perusal, review and comment for a 40-day period by placing the report at several locations including the local library and potentially at the Dishaba Mine offices, as well as on the Prime Resources' website. The availability hereof, as well as the commenting deadlines, contact details of the EAP and a short summary of the pertinent feedback issues will be communicated to registered IAPs in the form of a letter or second BID. After the IAPs have had an opportunity to comment on the draft EIA / EMP, the report will be revised with the feedback obtained and this revised report will be made available for a further 21-day commenting period to registered IAPs before the final EIA / EMP is submitted to the DMR and LEDET for consideration.

8 SCOPED ISSUES AND POTENTIAL IMPACTS IDENTIFIED

8.1 Introduction

This section details the issues that were raised and investigated during the Scoping Phase, and outlines the potential impacts (including cumulative impacts) associated with the proposed development. The potential issues identified will still be fully investigated during the EIA phase.

8.2 Land Capability and Soil Potential

The proposed backfill plant is to be developed within an area already disturbed by mining activities, while the proposed pipeline will be situated within the servitude adjoining Dishaba and the Amandelbult TSFs. The area for development of the proposed satellite pump station is considered natural. The potential impacts regarding land transformation and soil potential within the mining area will be assessed as part the of the EIA.

8.3 Ecology (Flora and fauna)

Although the pipeline runs along an existing servitude, the flora and fauna adjacent to the servitude will need to be cleared at a breadth of approximately 5-10m for the pipeline to be installed upon plinths not directly within the vehicle access portion of the servitude. The same applies to the pump station at the Amandelbult TSF. The Backfill Plant will be located adjacent to the Dishaba Mine; the proposed land within this footprint is largely disturbed by mining activity and very little natural habitat remains. As natural vegetation will need to be cleared for the proposed pipeline and pump station an Ecological Scan will be undertaken by Strategic Environmental Focus (SEF) to identify ecologically-sensitive features such as possible wetland areas, primary grassland and floral and faunal species of concern. Recommendations will be made with regards to mitigation measures and possible additional studies within the area.

8.4 Groundwater

While previous groundwater studies found the risk of mining development on groundwater to be of low significance, the potential for the generation of poor quality seepage arising from recharging groundwater coming into contact with backfill material will be further investigated. A specialist statement in response to potential and future potential leaching post mine closure arising from backfilled panels will be commissioned.

8.5 Surface Water

While the Bierspruit and Crocodile River are sufficiently distanced from the proposed project, the potential risks to surface water arising from mixing of clean stormwater runoff and polluted water

at the backfill plant or with backfill material. The potential impacts in this regard will be further investigated in the EIA / EMP.

8.6 Wetlands

The potential impacts to wetlands arising from the proposed backfill project are considered negligible considering the proximity of the project to the wetlands (distance greater than 500m).

8.7 Air Quality

The proposed development will entail the piping of tailings material in solution to the existing shaft complex at Dishaba. No processes involved are considered as potential generators of particulate matter which may impacts air quality (i.e. no stockpiling of dry tailings, fallout from stockpiles or vehicle entrainment will be involved). No impacts on the ambient air quality are thus anticipated.

8.8 Traffic

There are unlikely to be any effects upon traffic or existing roads as the pipeline will run along an existing servitude within the mining area.

8.9 Blasting and Vibrations

The proposed development will not produce any blasting or vibrations.

8.10 Noise

It is not likely that the proposed development will affect the current ambient noise levels considering the setting and nature of the project. The only potential generation of noise in this regard may be that arising from the operation of pumps, however, this is not likely to ever exceed 75dB.

8.11 Socio-Economic Environment

The proposed backfill project will not result in the creation of new jobs but will serve to ensure the continued employment, procurement, local development and training of individuals at the Dishaba Mine by allowing for mining activities to continue until approximately 2055. The construction team for the proposed project will be outsourced by Murray and Roberts and this team will reside off site during construction. The EIA / EMP will identify means to enhance the potential positive benefits in this regard.

8.12 Cumulative impacts

During the EIA phase, the significance of the potential cumulative impacts for all potentially affected areas of influence will be assessed and mitigation / management and monitoring measures proposed accordingly.

9 PLAN OF STUDY FOR THE ENVIRONMENTAL IMPACT ASSESSMENT

The purpose of this section is to describe the approach proposed by which to conduct the EIA.

9.1 Description of Tasks to be undertaken, including Specialist Investigations

The further specialist input required will be in terms of geohydrology and ecology. The geohydrology specialist study will assess the potential long-term effects from the backfill panels. The ecological specialist study will confirm the presence and location of any sensitive habitats and species within the project area. As such, leach-testing of backfill material will be undertaken under the direction of a groundwater specialist who will review the findings thereof and ascertain:

- The potential for leaching to occur, post-closure of the Dishaba Mine, should recharging groundwater come into contact with the backfill material;
- Future management and monitoring measures to mitigate and monitor the above.

The outcome of the above mentioned specialist review will be incorporated into a draft EIA, which will then be prepared and made available for public comment. All departmental and IAP feedback will then be incorporated into the issues trail. A draft EMP will then be prepared. The additional quantum for closure related financial provision will be calculated. The public consultation process discussed in Section 7 will then take place and any feedback incorporated. The draft EIA / EMP will then be amended to incorporate any public/government authority feedback, before being submitted to the DMR.

9.2 Stages at which the Competent Authorities will be consulted

Authorities will be consulted when a draft EIA/EMP is available for a 40 day commenting period. The report will then be revised with any outcomes thereof and submitted for a further 21-day commenting period, after which the final report will be provided to the DMR / LEDET for consideration. Refer to the scoping and EIA process diagram in Section 2 above.

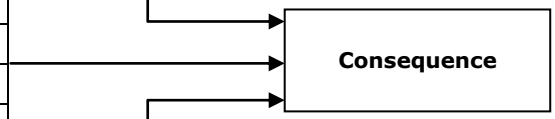
9.3 Methodology Proposed for the Assessment of Impacts

The significance of an impact is assessed by rating each variable numerically according to defined criteria as outlined below. The severity, spatial scope, and duration of the impact together comprise the consequence of the impact (when summed obtaining a maximum value of 15). The frequency of the activity and the frequency of the impact together comprise the likelihood of the impact occurring (when summed obtaining a maximum value of 10).

Severity of Impact	Rating
Insignificant / non-harmful	1
Small / potentially harmful	2
Significant / slightly harmful	3
Great / harmful	4
Disastrous / extremely harmful	5

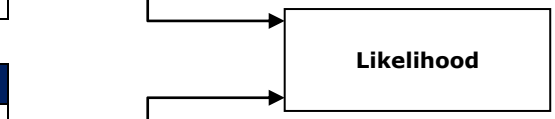
Spatial Scope of Impact	Rating
Activity specific	1
Area specific	2
Whole project site / local area	3
Regional	4
National	5

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



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

Frequency of Impact	Rating
Almost never / almost impossible	1
Very seldom / highly unlikely	2
Infrequent / unlikely / seldom	3
Often / regularly / likely / possible	4
Daily / highly likely / definitely	5



The values for likelihood and consequence of the impact are then read off a significance rating matrix as displayed below. The model outcome of the impacts is then assessed in terms of impact certainty and consideration of available information.

LIKELIHOOD (Frequency of activity + Frequency of impact)	CONSEQUENCE (Severity + Spatial Scope + Duration)														
	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 Mangement Recommendation	Possitive Impact Mangement Recommendation
	Very high	126-150	Improve current management	Maintain current management
	High	101-125	Improve current management	Maintain current management
	Medium-high	76-100	Improve current management	Maintain current management
	Low-medium	51-75	Maintain current management	Improve current mangement
	Low	26-50	Maintain current management	Improve current mangement
	Very low	1-25	Maintain current management	Improve current mangement

10 REFERENCES

- Amplats, 2011. Scope of work for: Dishaba Backfilling EMP / EIA and WULA Amendments.
- J9 Environmental, 2012: Backfill Plant project: Feasibility Study Gap Analysis and Scope of Work.
- Low, A. B. & Rebelo, A. G. 1998: *Vegetation of South Africa, Lesotho and Swaziland.* Department of Environmental Affairs and Tourism. Pretoria.
- Paterson & Cooke Consulting Engineers, 2012: Dishaba Mine Backfill Plant: Front End Design. Claremont, Cape Town.
- RPM-AS, 2011. RPM: Amandelbult Section IWWMP.
- SSI Environmental, 2008: Air Quality Impact Assessment for the proposed construction and operation of the Chromite Recovery Plant at the Anglo Platinum Amandelbult Section.
- Thabazimbi Local Municipality, 2012: Integrated Development Plan.
- WSP, 2007. *Anglo Platinum Limited - Amandelbult Section: Environmental Impact Assessment Report (Volume 1): Merensky Project,* WSP House, Bryanston Place Office Park, 199 Bryanston Drive, Bryanston, 2021.
- WSP, 2007. *Anglo Platinum Limited - Amandelbult Section: UG2 Project Environmental Impact Assessment and Management Programme*, WSP House, Bryanston Place Office Park, 199 Bryanston Drive, Bryanston, 2021.