ANGLO OPERATIONS LIMITED:

GREENSIDE COLLIERY - NEW DISCARD FACILITY

DRAFT SCOPING REPORT UNDER NEMA, 1998

Locality: eMalahleni

MDEDET Ref No: 17/2/3N-205

Date: 18 November 2013

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Unit C8
Block @ Nature
472 Botterklapper Street
Pretoria

Office: + 27 (0)12 807 7036
Fax: +27 (0)12 807 1014

PROJECT DETAILS

Mpumalanga Department of Economic Development, Environment and Tourism (MDEDET)

Reference No.: 17/2/3N-205

Project Title: GREENSIDE COLLIERY - NEW DISCARD FACILITY

Project Number: ANG-GRE-12-03-23

Compiled by: Minnette Le Roux

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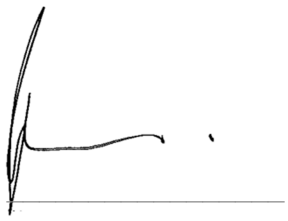
Location: eMalahleni

Technical Reviewer: Brian Hayes



RB Hayes (Pr.Eng.)

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

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DEFINITIONS

Environment

The surroundings (biophysical, social and economic) within which humans exist and that are made up of

- the land, water and atmosphere of the earth;
- micro-organisms, plant and animal life;
- any part or combination of (i) and (ii) and the interrelationships among and between them; and,
- the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and wellbeing.

Environmental Aspects

Elements of an organization's activities, products or services that can interact with the environment.

Environmental Degradation

Refers to pollution, disturbance, resource depletion, loss of biodiversity, and other kinds of environmental damage; usually refers to damage occurring accidentally or intentionally as a result of human activities.

Environmental Impacts

Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's activities, products or services.

Environmental Impact Assessment

A study of the environmental consequences of a proposed course of action.

Environmental Impact Report

A report assessing the potential significant impacts as identified during the environmental impact assessment.

Environmental impact

An environmental change caused by some human act.

Land use

The various ways in which land may be employed or occupied. Planners compile, classify, study and analyse land use data for many purposes, including the identification of trends, the forecasting of space and infrastructure requirements, the provision of adequate land area for necessary types of land use, and the development or revision of comprehensive plans and land use regulations.

Pollution Prevention

Any activity that reduces or eliminates pollutants prior to recycling, treatment, control or disposal.

Public Participation Process

A process of involving the public in order to identify needs, address concerns, in order to contribute to more informed decision making relating to a proposed project, programme or development.

Topography

Topography, a term in geography, refers to the "lay of the land" or the physio-geographic characteristics of land in terms of elevation, slope and orientation.

Vegetation

All of the plants growing in and characterizing a specific area or region; the combination of different plant communities found there.

Waste

Waste is unwanted or undesired material left over after the completion of a process. "Waste" is a human concept: in natural processes there is no waste, only inert end products.

ABBREVIATIONS

AMD – Acid Mine Drainage
AOL – Anglo Operations Limited
AEMC – Attainable Ecological Management Classes
BID – Background Information Document
CBD – Central Business District
CRR – Comments and Response Report
DWA – Department of Water Affairs
DMR – Department of Mineral Resources
EAP – Environmental Assessment Practitioner
EIA – Environmental Impact Assessment
EIS – Ecological Importance and Sensitivity
EIR – Environmental Impact Report
EMC – Ecological Management Class
EMF – Environmental Management Framework
EMP – Environmental Management Programme
GN – Government Notice
IWULA – Integrated Water Use Licence Application
IWWMP – Integrated Water and Waste Management Plan
I&AP – Interested and Affected Party
KM – Kilometres
KV – Kilovolts
LOM – Life of Mine
MAMSL – Metres Above Mean Sea Level
MAP – Mean Annual Precipitation
MAE – Mean Annual Evaporation
MM – Millimetres
MDEDET – Mpumalanga Department of Economic Development, Environment and Tourism
MPRDA – Mineral and Petroleum Resources Development Act, Act 28 of 2002
MT – Million Tons
NEMA – National Environmental Management Act, Act 107 of 1998 as amended
PES – Present Ecological Status
PPP – Public Participation Process
R – Regulation
RE – Remaining Extent
RLT – Rapid Loading Terminal
ROM – Run of Mine
SASS – South African Scoring System
S&EIR – Scoping and Environmental Impact Report

EXECUTIVE SUMMARY

The Applicant:

Greenside Colliery is a coal mine that is managed by Anglo American Thermal Coal, a Division of Anglo Operations Proprietary Limited (AOL).

This Colliery was acquired by AOL in 1998 from Gold Fields Coal Limited. This acquisition forms part of Anglo American Thermal Coal's overall strategy to rationalise mining related to the Greenside, Kleinkopje and Landau Collieries, which forms the South African Coal Estate complex.

Greenside Colliery is an underground mining operation that was established to supply coal via the Richards Bay Coal Terminal to various export markets. In accordance with the Anglo American Thermal Coal Policy, Greenside Colliery also supplies a small amount of coal to the domestic markets. Greenside Colliery produces thermal coal for the export and domestic markets (from the Number.4 Seam) using bord-and-pillar underground mining method.

Background description:

The acquisition in 1998 resulted in changes to the planned Life of Mine (LOM), upon which it became necessary to upgrade and extend the current discards disposal facility to accommodate the updated LOM, that was forecasted to 2035 (i.e. 37 years from 1998). A feasibility study was conducted during 2000 by the consulting engineers, Wates, Meiring and Barnard. This study concluded that the current discard facility would not be able to accommodate the discards for the full LOM; the best option would be to extend the existing facility as far as possible.

The current LOM is 10 years at full production with an average of 4.8 Million tons (Mt) Run of Mine (ROM) annually, delivering an average of 2.8 saleable Mt per annum until 2021 and 2.3 Mt in 2022. The current active coal discard disposal facility is situated above the old and future underground workings.

During a recent reassessment of the LOM design of the discard facility it was ascertained that historical mining methods in the areas beneath the facility had not taken into account the planned extent and height of the discard facility, as well as the impact of the facility on the stability of pillars in the mined areas. Subsequently an extensive exercise was completed to accurately ascertain the safety factors of the pillars underneath the discard facility. It was determined that the current safety factors of the pillars would not be able to support the discard facility should it be raised to full height according to the design.

The discard facility has minimal potential for further increases in height. The design was based on a maximum discards deposition rate of 110 000 tonnes per month, and a maximum fines deposition rate of 27 000 tonnes per month. However, the quantity of fines exceeded these predictions, requiring additional containment to be built up by upstream impoundment construction methods. In order to continue with

discards disposal operations, the mine has extended the dump into the old housing areas to the south west.

The proposed new discard facility project was initiated as a result of limited volumetric air space remaining on the current active coal discard disposal facility.

Location:

The Greenside Colliery is situated approximately 15 km southwest of eMalahleni in the eMalahleni Local Municipality of the Nkangala District Municipality in the Mpumalanga Province.

The proposed new discard facility and associated infrastructure will be mainly located on Portion 0, 2 and 3 of the farm Groenfontein 331 JS.

Project description:

The new discard facility is required to accommodate the LOM discard tonnages, as well as possible LOM extension tonnages. The discard facility will be able to accommodate some 35 Mt of discards. The conceptual design of the facility will require the following associated infrastructure:

- An Overland Conveyor System.
- Bridge crossing.
- Discard Silo.
- Haul roads.
- Dirty and Clean Water Separation Systems.
- The Workshop and associated Offices Complex.
- Power Lines.

High level designs are being developed for the proposed new discard facility and the associated infrastructure, these designs will be presented as part of the final Environmental Impact Report (EIR). The objectives of these designs are to produce an environmentally acceptable, economically constructed and operated disposal facility. The specific goals for developing high level designs for the new discard facility and associated infrastructure are listed as follows:

- Positioned as close as possible to the coal beneficiation plant.
- Require minimum capital expenditure.
- Be simple and economical to operate.
- Minimise surface and ground water pollution.
- Minimise the impact on the environment during the entire facility life cycle.

Process:

As part of the proposed new discard facility project listed activities defined under the National Environmental Management Act, Act 107 of 1998 (NEMA, 1998) and the regulations thereunder will take place.

In order to obtain environmental authorisation, a Scoping Report and an Environmental Impact Assessment Report (EIR) must be compiled as described in terms of Regulations 26 to 35 of the Environmental Impact Assessment Regulations, 2010 promulgated in terms of Section 24(5), 24M and 44 of the NEMA, 1998.

It is the intention of this Scoping Report (which has been compiled in terms of the NEMA, 1998) to provide the necessary information pertaining to the proposed activities associated with the project, as required in terms of the Environmental Impact Assessment Regulations (EIA Regulations R543: EIA Regulations in terms of Chapter 5 of the NEMA, 1998, dated June 2010) under the NEMA, 1998. This Scoping Report intends to highlight all information relevant to the proposed new discard facility only, since the existing operations has been fully described in the approved Environmental Impact Assessment (EIA) and Environmental Management Programme (EMP) Reports under the NEMA, 1998 and the Mineral and Petroleum Resources Development Act, Act 28 of 2002 (MPRDA, 2002) respectively.

Anticipated impacts:

For the purpose of the Scoping report it is required by Regulation 28 (g) (of Regulation 543) of the EIA Regulations dated 2010, under the NEMA, 1998 that the major potential impacts the activities, processes and actions may have on the surrounding environment, is identified.

Regulation 31 (of Regulation 543) of the EIA Regulations, 2010, under NEMA, 1998, requires that an EIR includes an assessment of the status, extent, duration, probability, reversibility, replaceability of resources, and mitigatory potential of the major potential environmental impacts of the proposed project be undertaken.

The identification of the major potential impacts has therefore only been included as part of the requirements for the compilation of the Scoping Report. The prediction of the nature of each impact, the evaluation of each impact by rating its significance and the management and mitigation measures adopted to address each impact, will be assessed during the EIR.

The activities associated with the proposed project are described in full in Part 2 and the anticipated impacts of the proposed project are described in Part 6.2.

The major impacts that are expected to occur as a result of the anticipated activities as part of the proposed project within the existing mine boundary area, may combine with impacts resulting from

surrounding activities and land uses to form cumulative impacts, or to contribute to cumulative impacts that already exist. Regulation 28 (g) (of Regulation 543) of the EIA Regulations dated 2010, under the NEMA, 1998 requires that cumulative impacts are also considered.

A number of potentially significant impacts have been identified during the scoping process. Additional potentially significant impacts may be highlighted at a later stage. The extent of the identified potentially significant impacts will be quantified, and will be reported on as part of the EIR.

Part 6 of this Scoping Report includes more detail pertaining to the identified possible impacts that will be assessed and quantified during the EIA phase of the project.

Knowledge gaps:

The following knowledge gaps and uncertainties have been identified during the scoping process of the proposed new discard facility. These require further investigation, and will be comprehensively carried out as part of the EIA process for the proposed project:

- All relevant specialist studies need to be conducted for the area associated with the proposed new discard facility. The studies identified during the Scoping Phase include a Wetland study, Fauna and Flora Study, and a Geohydrological study.
- While impacts have been identified as part of the scoping process, it is required as part of the EIA Phase to fully quantify impacts to all aspects of the environment.
- High level designs are being developed for the proposed new discard facility and the associated infrastructure; these designs will be presented as part of the final EIR.

Content of the scoping report:

This Scoping Report (compiled in terms of the NEMA, 1998) is divided into the following parts:

- Part 1: Introduction.
- Part 2: Description of the project.
- Part 3: Description of the existing environment.
- Part 4: Public Participation Process.
- Part 5: Description of alternatives.
- Part 6: Identification of anticipated Environmental Impacts.
- Part 7: Identification of knowledge gaps and plan of study for EIA.
- Part 8: Discussion and Conclusion.

1. INTRODUCTION

Greenside Colliery is a coal mine that is managed by Anglo American Thermal Coal, a Division of Anglo AOL.

This Colliery was acquired by Anglo Operations Ltd in 1998 from Gold Fields Coal Limited. This acquisition forms part of Anglo American Thermal Coal's overall strategy to rationalise mining related to the Greenside, Kleinkopje and Landau Collieries, which forms the South African Coal Estate complex.

The acquisition in 1998 resulted in changes to the planned Life of Mine (LOM), upon which it became necessary to upgrade and extend the current discards disposal facility to accommodate the updated LOM, that was forecasted to 2035 (i.e. 37 years from 1998). A feasibility study was conducted during 2000 by the consulting engineers, Wates, Meiring and Barnard. This study concluded that the current discard facility would not be able to accommodate the discards for the full LOM; the best option would be to extend the existing facility as far as possible.

In order to continue with discards disposal operations, the mine has needed to extend the existing dump into the old housing areas to the south west.

The proposed new discard disposal facility project was initiated as a result of limited volumetric air space remaining on the active dump.

1.1 Regulatory requirements

As part of the proposed new discard facility project listed activities defined under the National Environmental Management Act, Act 107 of 1998 (NEMA, 1998) and the regulations thereunder will take place.

The Application for Environmental Authorisation for activities associated with the new discard facility project will be done in terms of the requirements of the NEMA, 1998. According to NEMA, AOL is required to submit an Application for Environmental Authorisation to the Mpumalanga Department of Economic Development, Environment and Tourism (MDEDET) which is competent authority for these activities.

The proposed activities would involve the following listed activities as identified in terms of Section 24 and 24D of the NEMA, 1998:

Table 8: Listed Activities in terms of NEMA, 1998

Number and date of the relevant notice	Activity No	Activity Description	Project Description
Government Notice R 544 18 June 2010 Listing Notice 1	9 (i) (ii) a & b	*The construction of facilities or infrastructure exceeding 1000 metres in length for the bulk transportation of water, sewage or storm water -* *(i) with an internal diameter of 0,36 metres or more; or* *(ii) with a peak throughput of 120 litres per second or more,* *excluding where:* *a. such facilities or infrastructure are for bulk transportation of water, sewage or storm water or storm water drainage inside a road reserve; or* *b. where such construction will occur within urban areas but further than 32 metres from a watercourse, measured from the edge of the watercourse.*	The construction of the return water, dirty water and potable water pipelines, fire water reticulation system for the conveyor, clean and dirty water channels and the sewage water pipeline.
Government Notice R 544 18 June 2010 Listing Notice 1	11 (ii) (iii) (iv) (x) (xi)	*The construction of:* *(ii) channels;* *(iii) bridges;* *(iv) dams;* *(x) buildings exceeding 50 square metres in size; or* *(xi) infrastructure or structures covering 50 square metres or more* *where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line.*	The clean and dirty water channels, sewage pipelines, potable water pipelines, pollution control dam, discard silo, workshop, and office complex ,overland conveyor, haul roads, road over the dam wall and parts of the discard facility may be constructed within the 500 metres buffer zone of the wetland areas and within 32m of the Greenside Spruit.
Government Notice R 544 18 June 2010 Listing Notice 1	13	*The construction of facilities or infrastructure for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 but not exceeding 500 cubic metres;*	The construction of diesel storage tanks at the workshop/office complex with a capacity to store more than 80 000 litres, but less than 500 000 litre of diesel.

Number and date of the relevant notice	Activity No	Activity Description	Project Description
Government Notice R 544 18 June 2010 Listing Notice 1	18 (i)	*The infilling or depositing of any material of more than 5 cubic metres into, or the excavation, removal or moving of soil, sand, or rock from of more than 5 cubic metres from; (i) a watercourse;*	The construction of the clean and dirty water channels, sewage pipelines, potable water pipelines, pollution control dam, discard silo, workshop, and office complex, overland conveyor, haul roads, road over the dam wall and parts of the discard facility may result in the infilling or depositing of any material of more than 5 cubic metres into, or the excavation, removal or moving of soil, sand, or rock from more than 5 cubic metres from a watercourse.
Government Notice R 544 18 June 2010 Listing Notice 1	22 (ii)	*The construction of a road, outside urban areas, (ii) where no reserve exists where the road is wider than 8 metres,*	The construction of haul roads for haul trucks to transport discard from the silo to the discard facility. Access roads to the site will also be constructed.
Government Notice R 544 18 June 2010 Listing Notice 1	28	*The expansion of or changes to existing facilities for any process or activity where such expansion or changes will result in the need for a new permit or license in terms of national or provincial legislation governing the release of emissions or pollution, excluding where the facility, process or activity is included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case that Act will apply.*	A Water Use Licence Application and updated Integrated Water and Waste Management Plan (IWWMP) will be conducted for this project resulting in a change to the existing Water Use Licence and IWWMP. An addendum to the EMP will also be conducted as part of this project.
Government Notice R 544 18 June 2010 Listing Notice 1	39 (iii)	*The expansion of (iii) bridges; within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, where such expansion will result in an increased*	The existing road over the dam wall (which act as a bridge) will be expanded to accommodate haul trucks to transport discard from the silo to the discard facility.

Number and date of the relevant notice	Activity No	Activity Description	Project Description
		development footprint but excluding where such expansion will occur behind the development setback line.	
Government Notice R 544 18 June 2010 Listing Notice 1	47 (ii)	*The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre -* *(ii) where no reserve exists, where the existing road is wider than 8 metres –* *excluding widening or lengthening occurring inside urban areas.*	The upgrading of the existing haul road over the Greensidespruit to transport discard from the silo to the discard dump. Access roads to the site will also be lengthened and/or widened.
Government Notice R 544 18 June 2010 Listing Notice 1	55 (i)	*The expansion of a dam where:* *(i) the highest part of the dam wall, as measured from the outside toe of the wall to the highest part of the wall, was originally 5 metres or higher and where the height of the wall is increased by 2,5 metres or more;*	Expansion of the road on the dam wall at Greensidespruit to be used for haul trucks, the dam wall will be increased in height by more than 2, 5 meters.
Government Notice R 545 18 June 2010 Listing Notice 2	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.*	A Water Use Licence Application and updated Integrated Water and Waste Management Plan (IWWMP) will be conducted for this project resulting in a change to the existing Water Use Licence and IWWMP. An addendum to the EMP will also be conducted as part of this project.
Government Notice R 546 18 June 2010	16 (iii) (iv) (a) (ii) (dd)	*The construction of:* *(iii) buildings with a footprint exceeding 10 square metres in size; or* *(iv) infrastructure covering 10 square*	The clean and dirty water channels, sewage pipelines, potable water pipelines, pollution control dam, discard silo,

Number and date of the relevant notice	Activity No	Activity Description	Project Description
Listing Notice 3		*metres or more where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line* *(a) In Eastern Cape, Free State, KwaZulu-Natal, Limpopo, Mpumalanga and Northern Cape:* *ii. Outside urban areas, in:* *(dd) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;*	workshop, and office complex ,overland conveyor, haul roads, road over the dam wall and parts of the discard facility may be constructed within the 500 metres buffer zone of the wetland areas. The John Cairn reserve was declared as a private nature reserve in 1970 under the old Transvaal Nature Conservation Ordinance, Ordinance 17 of 1967. The reserve covers Portion 2 of the Farm Groenfontein 331 JS.
Government Notice R 546 18 June 2010 Listing Notice 3	19 (ii) (cc) (gg)	*The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre.* *(a) In Eastern Cape, Free State, KwaZulu-Natal, Limpopo, Mpumalanga and Northern Cape provinces:* *ii. Outside urban areas, in:* *(cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;* *(gg) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core of a biosphere reserve.*	The existing haul road on the dam wall in the Greensidespruit is to be upgraded for haul trucks, situated in an approximate distance of 1 km from highly significant protected areas.

The applicable Environmental Authorisation Application Form under NEMA, 1998 was submitted to the Mpumalanga Department of Economic Development, Environment and Tourism (MDEDET) on the 30th of October 2012. A reference number (17/2/3N-205) was issued by MDEDET on the 9th of November 2012. The letter of acknowledgement indicating the above mentioned reference number is attached as **Appendix B1**.

In order to obtain environmental authorisation, a Scoping Report and an Environmental Impact Assessment Report (EIR) must be compiled as described in Regulations 26 to 35 of the EIA Regulations, 2010 promulgated in terms of Section 24(5), 24M and 44 of the NEMA, 1998.

It is the intention of this Scoping Report (which has been compiled in terms of the NEMA, 1998) to provide the necessary information pertaining to the proposed activities associated with the new discard facility, as required in terms of the EIA Regulations (EIA Regulations R543: Environmental Impact Assessment Regulations in terms of Chapter 5 of the NEMA, 1998, dated June 2010) under the NEMA, 1998. This Scoping Report intends to highlight all information relevant to the proposed new discard facility only, since the existing operations has been fully described in the current approved Environmental Impact Assessment (EIA) and Environmental Management Programme (EMP) under the Mineral and Petroleum Resources Development Act, Act 28 of 2002 (MPRDA, 2002) and NEMA, 1998.

1.2 Process to be followed

1.2.1 Objectives of the Scoping Process and the Scoping Report

Scoping is the procedure that is undertaken during the initial stages of the Planning Phase of a project, and is used to determine the extent of, and approach to an EIA (i.e. terms of reference). This process is required for the proposed project in terms of the NEMA, 1998 and the EIA Regulations, 2010 there under.

The objectives of the Scoping Process are to:

- Provide an opportunity for the Applicant, relevant Authorities and Interested and Affected Parties (I&APs) to exchange information and express their views and concerns regarding the proposed project before the EIA is undertaken.
- Focus the study on relevant anticipated impacts, issues and concerns, as well as reasonable alternatives, to ensure that the resulting EIA is useful to the Authorities for decision-making, and addresses the impacts, issues and concerns as identified.
- Facilitate an efficient assessment process that saves time, resources and costs.

The objectives of this Scoping Report are to provide:

- An overview of the proposed project.
- An overview of the environmental features of the proposed site and immediate surrounding area.
- An indication of the I&AP identified to date.
- An indication of issues of concern/comments received from I&APs to date.
- An indication of potential environmental impacts that could take place as a result of the proposed project.
- Report on the Scoping Process.
- Assess the adequacy and appropriateness of the scoping procedure followed and the Scoping Report submitted.
- Ensure that the Scoping Report reflects the impacts and provides appropriate alternatives.
- Ensure that the Scoping Report is adequate and appropriate, and contains relevant information that will determine the route indication and set appropriate boundaries for the EIA.

1.2.2 Methodology applied to conducting the scoping process

The Scoping Process for the project will be carried out in terms of the NEMA, 1998. The Scoping Process therefore consists of the following:

- Landowners within and adjacent to the mine boundary area, the relevant organs of state and stakeholders must be contacted and informed of the project (refer to **Part 4**).
- An Application for Environmental Authorisation Form must be compiled and submitted to the MDEDET (refer to **Appendix B1**).
- A Scoping Report describing all project activities as well as the listed activities (in terms of the NEMA, 1998) must be compiled in accordance with the requirements of the NEMA, 1998.
- The proposed project must be advertised in a local newspaper informing all potential I&APs of the project (refer to **Appendix D**).
- This Scoping Report must be made available to the public for comment for a period of 60 days.
- All comments received from the public during the public consultation period must be noted and recorded as part of the Scoping Report (refer to **Appendix D** and **Part 4**).
- The Scoping Report must be finalised taking all public comments into consideration.
- The Scoping Report must be submitted to the MDEDET and the I&APs for review.
- Provided that the Scoping Report is approved by the MDEDET, the EIA process can be carried out.

1.2.3 The Scoping Report in terms of the requirements of the NEMA, 1998

Regulation 28(1) of the EIA Regulations, 2010 under the NEMA, 1998, lists aspects that must be included in Scoping Reports. **Table 2** below indicates where the information has been provided as part of this Scoping Report:

Table 9: The Scoping Report in terms of the EIA Regulations, 2010, under the NEMA, 1998

Regulation No:		Description	Scoping Report Part
R543 Regulation 28(1)(a)		Details of the Environmental Assessment Practitioner (EAP).	Part 2 & **Appendix C**
	(i)	Details of the EAP who prepared the report.	
	(ii)	Details of the expertise of the EAP to carry out scoping procedures.	
R543 Regulation 28(1)(b)	(b)	A description of the proposed activity.	Part 2
	(c)	Any feasible and reasonable alternatives that have been identified.	Part 5
R543 Regulation 28(1)(c)		A description of the property on which the activity is to be undertaken and the location of the activity on the property.	Part 2
R543 Regulation 28(1)(d)		A description of the environment that may be affected by the activity and the manner in which the physical,	Part 3

Regulation No:		Description	Scoping Report Part
		biological, social, economic and cultural aspects of the environment may be affected by the proposed activity.	
R543 Regulation 28(1)(f)		An indication of all legislation and guidelines that have been considered in the preparation of the scoping report.	Part 1
R543 Regulation 28(1)(g)		A description of environmental issues and potential impacts, including cumulative impacts that have been identified.	Part 6
R543 Regulation 28(1)(h)		Details of the public participation process conducted in terms of Regulation 27(a).	Part 4 & **Appendix D**
	(i)	Steps taken to notify potentially interested and affected parties of the application.	
	(ii)	Proof that notice boards, advertisements and notices notifying potentially interested and affected parties of the application have been displayed, placed or given.	
R543 Regulation 28(1)(h)	(iii)	A list of all persons or organisations that were identified and registered in terms of Regulation 55 as interested and affected parties in relation to the application.	
	(iv)	A summary of the issues raised by interested and affected parties, the date of receipt of, and the response of the EAP to those issues.	
R543 Regulation 28(1)(i)		A description of the identified potential alternatives to the proposed activity, including advantages and disadvantages that the proposed activity or alternatives may have on the environment and communities that may be affected by the activity.	Part 5
R543 Regulation 28(1)(j)		A description of the need and desirability of the proposed activity.	Part 2
R543 Regulation 28(1)(k)		Copies of any representations and comments received in connection with the application or the scoping report from interested and affected parties.	Part 4 & **Appendix D**
R543 Regulation 28(1)(l)		Copies of any minutes of any meetings held by the EAP with interested and affected parties and other role players which record the views of the participants.	Part 4 & **Appendix D**
R543 Regulation 28(1)(m)		Any responses by the EAP to those representations and comments and views.	Part 4 & **Appendix D**
R543 Regulation 28(1)(n)		A plan of study for Environmental Impact Assessment	Part 7

Regulation No:		Description	Scoping Report Part
		(EIA) which sets out the proposed approach to the EIA of the application.	
	(i)	A description of tasks that will be undertaken as part of the EIA process including any specialist reports or specialised processes, and the manner in which such tasks will be undertaken.	
	(ii)	An indication of the stages at which the competent authority will be consulted.	Part 1, Part 4 & Part 7
	(iii)	A description of the proposed method of assessing the environmental issues and alternatives, including the option of not proceeding with the activity.	Part 5, 6 and Part 7
	(iv)	Particulars of the public participation process that will be conducted during the EIA process.	Part 4 and Part 7
R543 Regulation 28(1)(o)		Any specific information required by the competent authority.	Not Applicable *
R543 Regulation 28(1)(p)		Any other matters required in terms of Section 24(4) (a) and (b) of the Act.	Noted

* No specific requests have been received from the competent authorities to date.

The EIA process, which will be undertaken subsequent to the Scoping Process, will be conducted in accordance with Regulations 31 of the Environmental Impact Assessment Regulations, 2010 under the NEMA, 1998. The EIA document for the proposed project will include detailed information pertaining to anticipated or potential impacts that may be associated with the proposed project.

1.3 Applicable legislation, policies and / or guidelines

Table 3 below provides an indication of the main legislation, policies and / or guidelines applicable to the said project.

Table 10: Applicable legislation, policies and / or guidelines

Title of legislation, policy or guideline	Administering authority	Aim of legislation, policy or guideline
The Constitution of the Republic of South Africa, 1996 (Act 108 of 1996)		To establish a Constitution with a Bill of Rights for the RSA.
Development Facilitation Act, 1995 (Act 67 of 1995)		To provide for planning and development.
Environment Conservation Act, 1989 (Act 73 of 1989)	Department of Economic Development, Environment and Tourism	To control environment conservation.
National Environmental Management Act, 1998 (Act 107 0f 1998)	Department of Economic Development, Environment and Tourism	To provide for the integrated management of the environment.

National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004)	Department of Economic Development, Environment and Tourism	To reform the law regulating air quality in order to protect the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development while promoting justifiable economic and social development; to provide for national norms and standards regulating air quality monitoring, management and control by all spheres of government; for specific air quality measures; and for matters incidental thereto.
National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004)	Department of Economic Development, Environment and Tourism	To provide for the management and conservation of South Africa's biodiversity within the framework of the National Environmental Management Act, 1998; the protection of species and ecosystems that warrant national protection; the sustainable use of indigenous biological resources; the fair and equitable sharing of benefits arising from bio prospecting involving indigenous biological resources; the establishment and functions of a South African Biodiversity Institute; and for matters connected therewith.
National Environmental Management: Waste Act, 2008 (Act 59 of 2008)	Department of Economic Development, Environment and Tourism	To reform the law regulating waste management in order to protect health and the environment by providing for the prevention of pollution and ecological degradation and for securing ecologically sustainable development.
Environmental Impact Assessment Regulations, 2010 (Government Gazette No. 33306 of 18 June 2010)	Department of Economic Development, Environment and Tourism	Regulations pertaining to environmental impact assessments.
National Water Act, 1998 (Act 36 of	Department of Water Affairs	To control water management

1998)		aspects.
Natural Heritage Resources Act, 1999 (Act 25 of 1999)	South African Heritage Resources Agency	This legislation aims to promote good management of the national estate, and to enable and encourage communities to nurture and conserve their legacy so that it may be bequeathed to future generations.
Conservation of the Agricultural Resources Act, 1983 (Act 43 of 1989)	Department of Agriculture, Forestry and Fisheries	To provide control over the utilization of the natural resources of the Republic in order to promote the conservation of soil, the water sources and the vegetation and the combating of weeds and invader plants; and for matters connected therewith.
Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002)	Department of Mineral Resources	To make provision for equitable access to and sustainable development of the nation's mineral and petroleum resources; and to provide for matters connected therewith.
Mineral and Petroleum Resources Development Regulations, 2004 (No. R527 of 23 April 2004; GG 26275)	Department of Mineral Resources	
Mine Health and Safety Act, 1996 (Act 26 of 1996)	Department of Mineral Resources	To promote employee health and safety.
Health Act, 1977 (Act 63 of 1977)	Department of Health	To promote public health.
Mpumalanga Nature Conservation Act, 1998 (Act 10 of 1998)	Mpumalanga Tourism and Parks Agency	To control nature conservation.
Various by-laws of the eMalahleni Local Municipality	eMalahleni Local Municipality	To regulate land use with the eMalahleni Local Municipality area.
Integrated Development Plan for the eMalahleni Local Municipality	eMalahleni Local Municipality	Broad spatial framework guidelines for the eMalahleni Local Municipality.
Spatial Development Framework for the eMalahleni Local Municipality	eMalahleni Local Municipality	Spatially based policy guidelines whereby changes, needs and growth in the region can be managed to benefit the whole community.

2. DESCRIPTION OF THE PROJECT

2.1 Details of the project applicant

The details of the applicant proposing the project are given in **Table 4**.

Table 11: Details of the applicant

Name of Mine	Greenside Colliery
Applicant	Anglo Operations Proprietary Limited
Postal Address	PO Box 2851 Blackhill 1032
Responsible Person	Frank Glaeser
Telephone Number	(013) 690 4297
Facsimile Number	(013) 690 4355
Cell Phone Number	082 611 7354
E-Mail Address	Frank.glaeser@angloamerican.com
Company Registration No.	1921/006730/07

2.2 Details of the environmental assessment practitioner

Shangoni Management Services (Pty) Ltd was appointed by AOL to compile this Scoping Report for the proposed project in accordance with the requirements of the NEMA, 1998 and the EIA Regulations, 2010 there under. Shangoni Management Services (Pty) Ltd details are provided in **Table 5** below.

Table 12: Details of the Environmental Assessment Practitioner

Name	**Shangoni Management Services (Pty) Ltd**
Postal address:	P.O. Box 74726 Lynwood Ridge 0040
Contact person:	Minnette Le Roux
Affiliations:	Founding member of EAPSA
Tel:	+27 (0)12 807 7036
Fax	+27 (0)12 807 1014
Cell:	+27 (0)83 660 0622
E-mail:	minnette@shangoni.co.za

As required by Regulation 28(1) (a) (ii) of the EIA Regulations, 2010 under the NEMA, 1998, a summary of the CV of the EAP involved in the conducting of the Scoping Process and compiling the Scoping Report is given below, the full CV is also attached hereto in **Appendix C.**

Minnette completed a B.Sc. Honors degree from the University of Pretoria and is currently enrolled in the M.Sc. Environmental Management programme at the North West University (Potchefstroom). She also holds a Certificate in Implementing Environmental Management Systems (ISO 14001) and is a Founding member of the Environmental Assessment Practitioner Association of South Africa. Minnette has experience in completing the Environmental Assessment Processes for various projects, in the construction and large scale mining sectors, including amongst other; Environmental Impact Assessments, Scoping Reports, Basic Assessment Reports, Environmental Management Plans, Environmental Management Programmes, Integrated Water Use Licence Applications, Integrated Water and Waste Management Plans, Regulation GN 704 Audits, Water Use Licence Audits, Waste Licence Applications and various Application Forms as part of the Environmental Application Process.

2.3 Property description

The mining right area for Greenside Colliery is indicated in **Plan 2 and 4** in **Appendix A** and includes Portion 1, 2, 3 and the Remaining Extent (RE) of the farm Groenfontein 331 JS, Portion 1, 29 and the RE of the farm Blaauwkrans 323 JS, the RE of the farm Weltevreden 324 JS and Portion 7, 9, 10, 12, 13, 14, 15, 16 and 17 of the farm Vlaklaagte 330 JS.

The new discard facility and associated infrastructure is proposed to be located on Portion RE, 2 and 3 of the farm Groenfontein 331 JS (indicated in **Plan 2, 3 and 4** in **Appendix A**).

Portion 2 of the Farm Groenfontein 331JS is declared as a private nature reserve (Refer to Plan 6 and 7 in **Appendix A**). The John Cairn reserve was declared as a private nature reserve in 1970 under the old Transvaal Nature Conservation Ordinance, Ordinance 17 of 1967.

2.3.1 Mineral rights holders

Anglo Operations Proprietary Limited (formerly Anglo Operations Limited) is the mineral rights holder for the following properties, which are associated with Greenside Colliery:

- Portion 1, 2, 3 and the RE of the farm Groenfontein 331 JS.
- Portion 1, 29 and the RE of the farm Blaauwkrans 323 JS.
- The RE of the farm Weltevreden 324 JS.
- Portion 7, 9, 10, 12, 13, 14, 15, 16 and 17 of the farm Vlaklaagte 330 JS.

The mineral rights holder for the Greenside Colliery is listed in Table 6.

Table 6: Mineral rights owners to Greenside Colliery

Farm Name	Holder's Details
Portion 1, 2, 3 and the RE of the farm Groenfontein 331 JS	Anglo Operations Proprietary Limited
Portion 1, 29 and the RE of the farm Blaauwkrans 323 JS	
The RE of the farm Weltevreden 324 JS	
Portion 7, 9, 10, 12, 13, 14, 15, 16 and 17 of the farm	

Farm Name	Holder's Details
Vlaklaagte 330 JS	

2.3.2 Surface rights holders

AOL is the surface rights owner for the following properties, which are associated with Greenside Colliery:

- Portion 1, 2, 3 and the RE of the farm Groenfontein 331 JS.
- Portion 29 and the RE of the farm Blaauwkrans 323 JS.

The surface rights owners in the mining right area for the Greenside Colliery are listed in **Table 7**.

Table 7: Surface rights owners to Greenside Colliery

Farm Name	Owners Details
Groenfontein 331 JS Portion RE,1,2,3	Anglo Operations Limited
Blaauwkrans 323 JS Portion RE, 29	Anglo Operations Limited
Blaauwkrans 323 JS Portion 1	Transnet Ltd.
Weltevreden 324 JS Portion RE	Truter Boerdery Trust
Vlaklaagte 330 JS Portion 16, 17	Uitspan Uitbreidings
Vlaklaagte 330 JS Portion 7, 14	Rudolf Martinus Botha
Vlaklaagte 330 JS Portion 9	Madeleine Louw
Vlaklaagte 330 JS Portion 10	Morne Stander
Vlaklaagte 330 JS Portion 12	Stephanus Johannes Petrus Duvenhage
Vlaklaagte 330 JS Portion 13	Adistra 96 CC
Vlaklaagte 330 JS Portion 15	Marie Liebenberg

The contact information of the landowners is available from the mine on request.

2.3.3 Land tenure and use of immediately adjacent land

Land use adjacent to the mining right area of the Greenside Colliery is predominantly agricultural and mining. The surface owners of all farm portions immediately adjacent to the Greenside Colliery are listed in **Table 8**.

Table 8: Adjacent Surface Rights Owners to Greenside Colliery

Farm Name	Owners Details
Klippan 332 JS Portion 0, 2, 6, 7	Anglo Operations Limited
Klipfontein 323 JS Portion 0, 9, 145	Anglo Operations Limited
Blaauwkrans 323 JS Portion 0, 2, 7, 10, 14, 15	Anglo Operations Limited
Blaauwkrans 323 JS Portion 4, 17	Transnet Ltd.
Elandsfontein 209 JS Portion 2	Anglo Operations Limited
Weltevreden 324 JS Portion 3, 4	National Department of Land Affairs
Vlaklaagte 330 JS Portion 0, 1, 3, 4	Uitspan Uitbreidings Pty Ltd.
Vlaklaagte 330 JS Portion 2	Jacobus Theodorus du Preez
Vlaklaagte 330 JS Portion 5, 6	Republic of South Africa

Farm Name	Owners Details
Vlaklaagte 330 JS Portion 8	Barend Johannes Venter
Vlaklaagte 330 JS Portion 11	Ludwig Paul van Schalkwyk
Waterpan 8 IS Portion 0	Duiker Mining Pty Ltd.
Tweefontein 13 IS Portion	Duiker Mining Pty Ltd.

The contact information of the landowners is available from the mine on request.

2.4 Regional Setting and Location of Activity

2.4.1 Magisteral District and Administrative boundaries

Greenside Colliery falls within the administrative boundaries presented in **Table** 9. Refer also to **Plan 1** in **Appendix A**, which indicates the regional setting of Greenside Colliery.

Table 9: Administrative boundaries of Greenside Colliery

Province	Mpumalanga Province
District Municipality	Nkangala District Municipality
Local Municipality	Emalahleni Local Municipality
Ward	30
Department of Mineral Resources (DMR) Local Office	DMR (Emalahleni)
Department of Water Affairs (DWA) Local Office	DWA (Bronkhorstspruit)
Department of Environmental affairs (DEA) Local Office	DEDET (Mpumalanga)
Catchment Zone	Quaternary catchment s B20G, B11G and B11F
Rainfall Zone	B1A, B1C and B2C
Water Management Area	Olifants River Catchment area
Water Forums	Olifants River Catchment Forum

2.4.2 Location of the Mine

The closet major town to Greenside Colliery is eMalahleni, located 15 km to the north east. Blackhill Siding and an associated village are situated 2 km northwest of the mine infrastructure area. The Landau Colliery village is situated 1 km east of Greenside Colliery. The town of Ogies is located 20 km southwest of Greenside Colliery. The N12 highway linking Johannesburg to eMalahleni runs northeast-southwest along the south eastern boundary of Greenside Colliery. The regional setting of Greenside Colliery is indicated in **Plan 1** in **Appendix A**.

2.4.3 Location of the Site

The proposed new discard facility project and associated infrastructure will be located on Portion 0, 2 and 3 of the farm Groenfontein 331JS.

The centre co-ordinates of the site are as follows:

- 25º 58.048’ S;
- 29º 12.111’ E.

2.4.4 Site description

Currently, only the No. 4 Seam is mined by the bord-and-pillar mining method. Coal obtained from the number 4 Seam is currently treated in the Greenside Colliery no. 4 Seam plant, which is located north of the main offices. The coal discard from the No 4 Seam beneficiation plant is deposited on the

consolidated coal discard dump at Greenside Colliery. Coal is conveyed from the plant to the Rapid Loading Terminal (RLT) for distribution to the markets. Greenside Colliery produces coal for both export and local markets. The utilisation of the surface infrastructure at Greenside Colliery, including the coal beneficiation plant, will continue up to 2023. Surface infrastructure pertaining to the Greenside Colliery is depicted in **Plan 8** in **Appendix A**.

The N12 highway connecting Gauteng with Mpumalanga crosses the Greenside Colliery mine. The mine is linked by district road number 193 to eMalahleni. A number of gravel roads connect the mine shafts with the mine complex. Potable water to Greenside Colliery is supplied from the eMalahleni Water Treatment Plant. Electrical power to the mine is supplied by Eskom from its national grid. Power lines cross the mine connecting eMalahleni to the national grid.

Three overland conveyors connect Greenside, Landau and Kleinkopje Collieries to the RLT located at the north eastern portion of the Greenside Colliery. The RLT is managed as an industrial operation by Anglo American Thermal Coal and handles all export coal. The RLT is serviced by Blackhill Station. In total, 18 vertical and inclined shafts are located on the Greenside Colliery. These shafts access the number 2, 4 and 5 Seams.

The greenside discard dump will be situated in 3A North that falls within the surface- and mining rights of Greenside . 3A North pit has been opencast mined by Kleinkopje Colliery.

2.5 Description of the proposed activity

2.5.1 Nature of the activity / development

As previously indicated Greenside Colliery is a coal mine that is managed by Anglo American Thermal Coal, a Division of AOL.

This Colliery was acquired by AOL in 1998 from Gold Fields Coal Limited. This acquisition forms part of Anglo American Thermal Coal's overall strategy to rationalise mining related to the Greenside, Kleinkopje and Landau Collieries, which forms the South African Coal Estate complex.

Greenside Colliery is an underground mining operation that was established to supply coal via the Richards Bay Coal Terminal to various export markets. In accordance with the Anglo American Thermal Coal Policy, Greenside Colliery also supplies a small amount of coal to the domestic markets. Greenside Colliery produces thermal coal for the export and domestic markets (from the Number.4 Seam) using bord-and-pillar underground mining method.

The acquisition in 1998 resulted in changes to the planned Life of Mine (LOM), upon which it became necessary to upgrade and extend the current discards disposal facility to accommodate the updated

LOM, that was forecasted to 2035 (i.e. 37 years from 1998). A feasibility study was conducted during 2000 by the consulting engineers, Wates, Meiring and Barnard. This study concluded that the current discard facility would not be able to accommodate the discards for the full LOM; the best option would be to extend the existing facility as far as possible.

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The current LOM is 10 years at full production with an average of 4.8 Million tons (Mt) Run of Mine (ROM) annually, delivering an average of 2.8 saleable Mt per annum until 2021 and 2.3 Mt in 2022. The current active coal discard disposal facility is situated above the old and future underground workings.

During a recent reassessment of the LOM design of the discard facility it was ascertained that historical mining methods in the areas beneath the facility had not taken into account the planned extent and height of the discard facility, as well as the impact of the facility on the stability of pillars in the mined areas. Subsequently an extensive exercise was completed to accurately ascertain the safety factors of the pillars underneath the discard facility. It was determined that the current safety factors of the pillars would not be able to support the discard facility should it be raised to full height according to the design.

The discard facility has minimal potential for further increases in height. The design was based on a maximum discards deposition rate of 110 000 tonnes per month, and a maximum fines deposition rate of 27 000 tonnes per month. However, the quantity of fines exceeded these predictions, requiring additional containment to be built up by upstream impoundment construction methods. In order to continue with discards disposal operations, the mine has extended the dump into the old housing areas to the south west.

The proposed new discard facility project was initiated as a result of limited volumetric air space remaining on the current active coal discard disposal facility.

The proposed new discard disposal facility project was initiated as a result of limited volumetric air space remaining on the active dump.

The proposed new discard dump project and associated infrastructure will be located on Portion 0, 2 and 3 of the farm Groenfontein 331JS.

The new discard facility is required to cater for the LOM discard tonnages as well as possible LOM extension tonnages and accommodate some 35 million tons of discards. **Table 10** below details the expected production figures for the life of mine and the required volumes based on an in-situ density of 1.6 t/m3 for coarse discard and 1.0 t/m3 for fines/slimes.

Table 130: Production Figures

Stage	Discard (Tons)	Slimes (Tons)	Discard (m3)	Slimes (m3)	Total (m3)
Jan 2015 - Dec 2017	8 661 285	2 101 028	5 413 303	2 101 028	7 514 331

Jan 2018 - Dec 2020	8 621 759	2 089 735	5 388 599	2 089 735	7 478 334
Jan 2021 - Dec 2023	5 717 174	1 686 304	3 573 234	1 686 304	5 259 538
Jan 2024 - Dec 2027	4 348 386	1 747 887	2 717 741	1 747 887	4 465 628
Total	**27 348 603**	**7 624 953**	**17 092 877**	**7 624 953**	**24 717 830**

The conceptual design of the facility will require the following associated infrastructure:

- An Overland Conveyor System.
- Bridge crossing.
- Discard Silo.
- Haul roads.
- Dirty and Clean Water Separation Systems.
- The Workshop and associated Offices.
- Power Lines.

High level designs are being developed for the proposed new discard facility and the associated infrastructure; these designs will be presented as part of the final EIR. The objectives of these designs are to produce an environmentally acceptable, economically constructed and operated disposal facility. The specific goals for developing high level designs for the new discard facility and associated infrastructure are listed as follows:

- Positioned as close as possible to the coal washing plant.
- Require minimum capital expenditure.
- Be simple and economical to operate.
- Minimise surface and ground water pollution.
- Minimise the impact on the environment during the entire facility life cycle.

2.5.2 Reason for project

The proposed new discard disposal facility project was initiated as a result of limited volumetric air space remaining on the active dump.

The new discard facility is required to cater for the LOM discard tonnages as well as possible LOM extension tonnages and accommodate some 35 million tons of discards

AOL requires the necessary environmental authorisations for the construction of the proposed new discard facility

In order to obtain environmental authorisation, a Scoping Report and an EIR must be compiled as described in Regulations 26 to 35 of the Environmental Impact Assessment Regulations, 2010 promulgated in terms of Section 24(5), 24M and 44 of the NEMA, 1998.

2.5.3 Extent of activity

The footprint area of the new discard facility will be approximately 115 hectares in size and the proposed new discard dump and associated infrastructure will be located on Portion 0, 2 and 3 of the farm Groenfontein 331JS (refer to **Plan 2, 3 and 4** in **Appendix A**)

2.5.4 Activity infrastructure description

The conceptual design of the new discard facility will require the following associated infrastructure and can be seen on **Plan 3** in **Appendix A**:

- An Overland Conveyor System.
- Bridge crossing.
- Discard Silo.
- Haul roads.
- Dirty and Clean Water Separation Systems.
- The Workshop and associated Offices.
- Power Lines.

2.5.4.1 Overland Conveyor System

The overland conveyor system will transport discard from the existing Greenside processing facilities and the proposed discard re-treatment processing plant. Dewatered fines from both of these plants will also be transported on this conveyor to the discard silo at the new discard dump. Sufficient controls will be in place at the conveyor loading facilities to ensure no more than 30% of the combined material on the conveyor is fines. The expected length of the overland conveyor will be approximately 2 kilometres.

2.5.4.2 Bridge Crossing

The overland conveyor will cross over the N12 on an existing bridge (bridge number 3785 and constructed in 1980) historically used to transport coal from underground workings beneath the proposed discard facility footprint to the Greenside processing plant. The overland conveyor will run along one side of the bridge with the other side reserved for light vehicles. To prevent dust from the conveyor obscuring traffic, a suitable covering will be placed over the conveyor. A fire deluge system will be included on the conveyor. The bridge will also be used for potable water and power supply infrastructure from Greenside Colliery to the discard facility office complex.

2.5.4.3 Discard Silo

A new discard silo rated at 1000 tons, designed to accommodate bulk flow and discharge at a rate so that haul trucks/ADT's are filled in a safe manner (28m high x 30m diameter), will be required adjacent to the discard facility.

2.5.4.4 Haul Routes

The combined discard material will be hauled from the discard silo across a dam wall in the Greensidespruit and deposited systematically to build up the discard dump. These vehicles will also have to pass over Kleinkopje Colliery's land to reach the discard facility and existing haul roads will need to be maintained for this. Fuel deliveries for the operation will also be along these routes. An additional haul road will be required to join the existing routes to the workshop and office complex.

2.5.4.5 Dirty and Clean Water Separation System

Dirty water collection trenches will be established along the northern toe of the facility and extend around the east and west side of the facility. The dirty water will be directed via a silt trap into a 1:50 year polluted storm water attenuation dam. From here water will be pumped, via a pipeline running within the existing clean water culvert underneath the N12 highway, and discharge into the existing Greenside dirty water system.

Clean water cut-off trenches will be constructed at the outset and moved south every three years as the dump footprint extends. The clean water will be diverted into the existing wetland areas to the east and west of the facility. This water will then in return pass under two existing culverts below the N12 and into the registered Greensidespruit stream diversion. The concept of the dirty and clean water separation system is illustrated in **Figure 1** below.

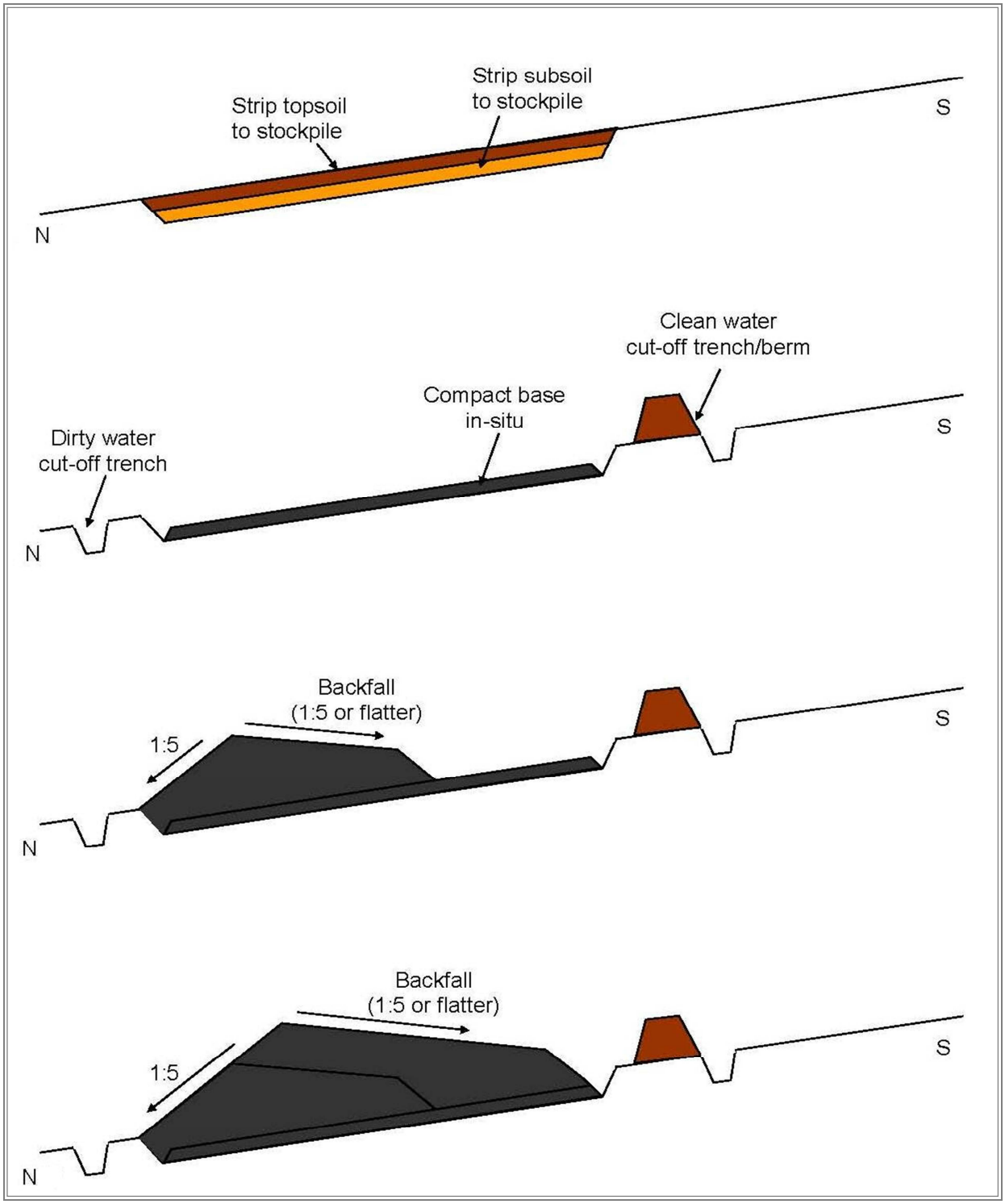

Figure 1: Clean and Dirty Water Separation

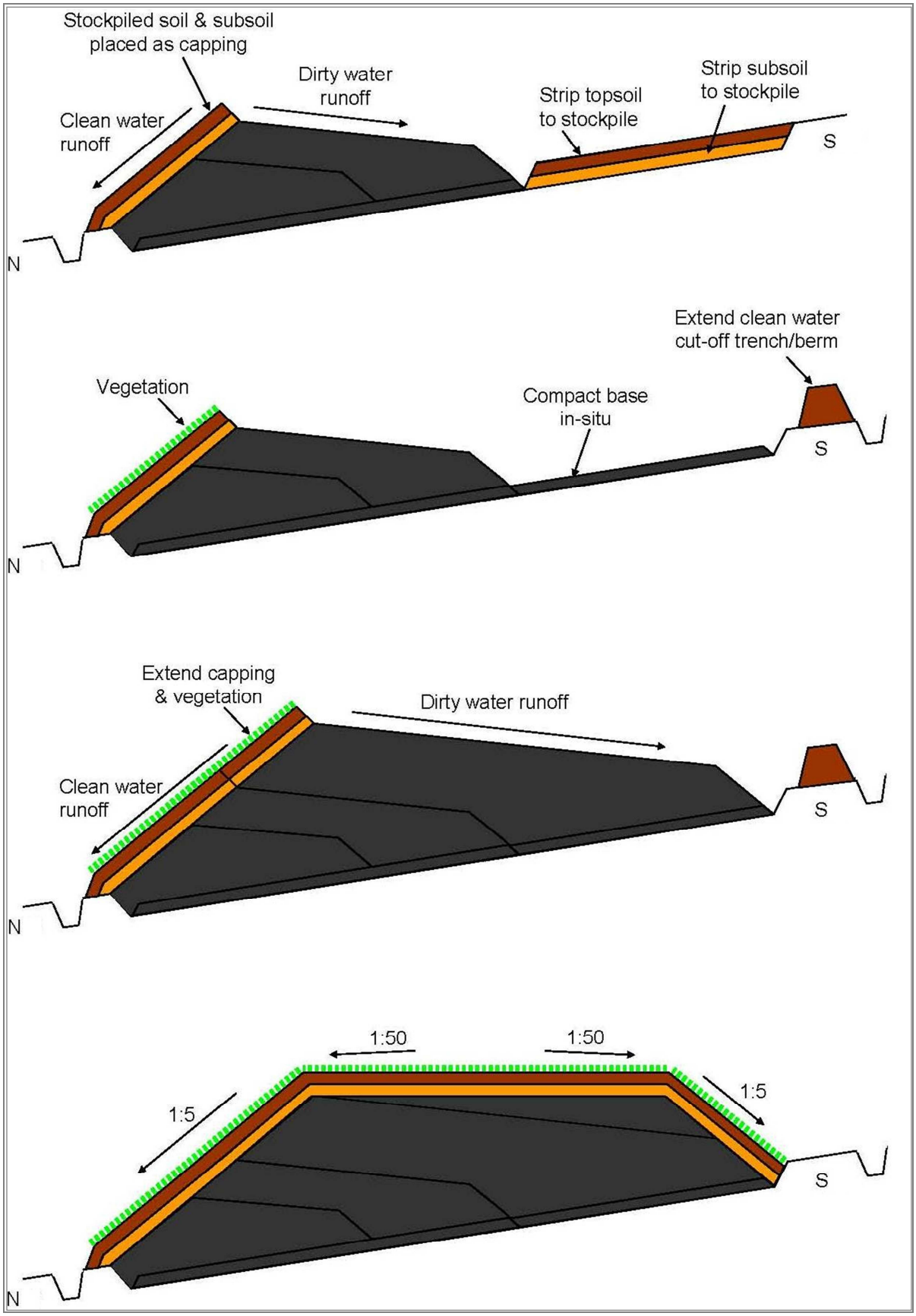

Figure 2: Clean and Dirty Water Separation continued

2.5.4.6 Workshop Complex

The workshop complex will consist of refuelling bays, workshops, offices and parking bays. Suitable bunding and oil/water separation will be required for the refuelling bays and workshop areas. The offices will consist of offices, change rooms, ablution facilities, meeting rooms and lunch/rest rooms. Septic tanks and soak ways will be required for the ablution facilities. Parking bays will be provided for both heavy and light vehicles. A brake test ramp and a dust suppression water tank and filling point will also be required. Sufficient lighting will be required around the workshop complex for 24 hour operations. All dirty water from the workshop complex will be routed through a silt trap into the discard dump dirty water collection trenches. The total footprint of the workshop complex will be approximately 14 000 square meters.

2.5.4.7 Power Lines and Electricity

The power shall be sourced from one of the following reticulation networks:
Power will be reticulated at 6.6kV by means of buried cable from existing Greenside 2 Substation for overland conveyor and silo supply, workshops, wash bay and office complex infrastructure and pollution control dam infrastructure.

The 22kV overhead line is to be fed off existing Eskom overhead line within 100m of proposed affected water pumping infrastructure.

2.5.4.8 The New Discard Disposal Facility

The footprint area of the new discard facility will be approximately 115 hectares with a maximum height of 55m. The sides slopes will be built following a whale back profile at an incline of 1v:5h and progressively rehabilitated with 500mm of compacted sub soil and 300mm of uncompacted top soil and vegetated. The facility will be developed from the lowest point adjacent to the N12 and progressively developed towards the south. This will keep the dirty water run-off length to a minimum and allow clean water to be diverted clear of the developing footprint.

Combined coarse and fine discards will be deposited by ATD haul trucks and built up in layers. Should compaction be necessary this will be accomplished with a vibratory roller. Performance criteria are currently being developed pending the results of geotechnical testing. The criteria will be to minimize voids so as to reduce the propensity for spontaneous combustion (SponCom) and reduce the potential for acid mine drainage (AMD). Should areas of the discard facility surface dry out, resulting in the generation of dust, a water bowser will be utilised for dust suppression.

To reduce the visual impact of the facility and prevent ADT headlights becoming a nuisance for motorists on the N12, a suitable indigenous tree screen will be planted.

2.5.5 Need and desirability of the project

The proposed new discard facility project was initiated as a result of limited volumetric air space remaining on the current active coal discard disposal facility. With this opportunity to construct a new discard facility Greenside Colliery intends to improve their coal fines recovery and develop a coal discard facility that will be an environmentally acceptable, economically constructed and operated disposal facility.

A number of methods to dispose coal fines and discards have been developed due to the challenging nature of the material. The particle specific density of coal fines is low; consequently the air dried density of the material can be lower than 1 resulting in the propensity for the material to float away. Forming self-impounding stable, drained and consolidated coal fines waste piles is therefore restricted to very arid areas. The most common means of managing coal discard in South Africa is to impound the fines within either earth embankments or discard embankments.

Oxidation of carbonaceous and pyretic coal fines and discards due to the ingress of water and air, results in an increased risk of SponCom and AMD. A proven means to manage SponCom has been to spread and compact the material in thin layers when forming the embankments. Ingress of water is minimized by shaping the facility into a smooth domed whale-back fashion thereby encouraging run-off and reducing infiltration. Maintaining a small pool around the penstock reduces the phreatic flow both through the fines and discard embankments. The risk of AMD is reduced by these two activities however practical constraints have led to significant AMD being generated on some facilities.

Improved coal fines recovery at the plant has decreased the economic value of fines – a major driver in the past for keeping discard and fines separate. Further improved efficiency of dewatering equipment is now able to produce a semi-dry fines material that can be combined with discards. As such the quantity of water within the deposit can be controlled upfront reducing the need for management at the point of deposition. The conceptual design therefore envisages a mixed product of gravel sized discard and fines being spread in layers to form a “Combined Dump”. It may also be possible that less compaction effort will be required as fines naturally fill the voids between the coarse discards particles. The risk of AMD and SponCom are therefore reduced.

To date this method has not had wide spread use in South Africa, with the method implemented at Klipspruit Colliery and piloted at Mafube Coal Mine. Difficulties have been experienced mainly associated with the discharge from the silo. In addition, deposition requires close management as the ratio of fines and discards varies along with the water content of the product.

More recently, bulk solids flow analysis test work was carried out in association with the Blaauwkrans expansion project at Landau Colliery resulting in a modified silo discharge design that can handle the combined product.

Further laboratory work is currently underway on the Greenside discards material (coarse and dewatered fines) to establish a conceptual geotechnical model for the behaviour of the combined product.

Should the discard facility project not be implemented, Greenside Colliery would run out of space to place their discard, and the Colliery will not be able to continue to supply coal to the existing markets at the current rate of demand. In return the jobs of workers that are currently employed at the Greenside Colliery may be lost. Positive impacts of the proposed project and improving the method of disposal of coal discard would also be lost if the project is not carried out.

Expected indirect benefits of the proposed project include:

- Continued employment of staff.
- Potential for the creation of additional jobs.
- Continued upliftment of the surrounding communities.
- Rehabilitation of environmental issues within the wetland areas.
- Continued supply of coal to the local, national, and international markets, and therefore contribution to local, provincial and national economy.

3. DESCRIPTION OF THE EXISTING ENVIRONMENT

This chapter provides an overview of the baseline environmental situation of the Greenside Colliery in terms of the Climate, Geology, Topography, Soil, Land capability and Land use, Fauna and flora, Surface water, Groundwater, Air quality, Noise and vibration, Sites of historical and archaeological significance, Sensitive landscapes, Visual aspects and the Socio-economic environment, which may directly or indirectly be affect the immediate and surrounding environment.

This section merely summarises the information obtained from existing documents with their supporting specialist studies. Information from various studies regarding the pre-mining environmental status as well as the changes to the environment due to existing mining activities have been conducted and pertinent information is included in this section.

The following terminology has been used throughout this document to describe the relevant surface areas that apply to this Report.

Table 11: Terminology

Area	Definition
Mining area	Actual mine boundary area as defined in terms of the new order Mining Right under the MPRDA, 2002 for the Greenside Colliery.
Study area	The extent of the study area is determined by the area of influence of the different environmental components relevant to each aspect. Thus, the study area referred to within the text applies to the specific component under description. The extent of the study area is therefore not influenced by the mine boundary area, but rather by the specific activity relative to the environmental component.
Area of surface disturbance	This refers to the area where the soil and vegetation is physically disturbed due to activities, i.e. the discard facility, the infrastructure associated with the discard facility, etc.
Dirty water management area	Surface area where polluted water is managed and will impact on receiving environment if not contained.

3.1 Geology

The Geology of the area, within which Greenside Colliery is situated, is dominated by that of sedimentary rock that developed at the base of the Ecca group of the Karoo Sequence. These sedimentary rocks are namely that of shale, sandstone and coal layers, and overlie the Dwyka formation. The layer of sedimentary rock is predominantly wavey although consistently horizontal in formation.

A North-South striking fault cuts across the Greenside Colliery. The fault cuts through an existing dome structure on site, which has resulted in variable throws along the faults strike. Sub-outcropping of a number of the coal seams against the weathered overburden has occurred as a result of the above mentioned dome structure. A number of dolerites dykes have intruded within and around the vicinity of the Greenside Colliery, and trend in a North-West South-East direction. Structural geological features like dykes and faults can have a measurable influence on groundwater flow and mass transport.

3.2 Climate

3.2.1 Regional climate

The region lies in the summer rainfall region (Highveld) of Southern Africa, with cold and dry winters, and warm and wet summers. Temperatures range from 9°C to 32°C in summer and from 6°C to 22°C in winter. Frost occurs frequently between May and September. During summer months prevailing winds are northerly or easterly and during the winter months prevailing winds are north westerly to south westerly.

Table 12 below indicates the average daily maximum and minimum temperatures for Mpumalanga Province.

Table 12: Mean daily maximum and minimum temperatures (adapted from Schulze et al 1997)

Month	Average Daily Maximum (ºC)	Average Daily Minimum (ºC)
January	26.8	15.3
February	26.5	15.0
March	25.6	13.8
April	23.6	13.5
May	21.7	6.9
June	19.1	3.8
July	19.4	3.7
August	21.7	6.0
September	27.0	9.3
October	28.5	11.7
November	29.3	13.4
December	26.4	14.7
Annual	**24.6**	**10.6**

3.2.2 Mean monthly and annual rainfall

3.2.2.1 Annual rainfall

The site occurs in Mpumalanga and falls in the summer rainfall region, which is characterised by thunderstorm activity and relatively low average rainfall. The mean annual rainfall is 743 mm, with 85 %

of this falling in the high rainfall months between October and March, compared to the mean annual potential evaporation of 1700 mm.

The Mean Annual Precipitation (MAP) in the Highveld Region varies from about 900 mm on its eastern boundary to about 650 mm in the west.

According to the Water Research Commission (WRC) Report No 298/1.2/94, dated 1994, the rainfall zones relevant to the Greenside Colliery is B1A, B1C and B2C.

The average annual and monthly precipitation figures for Greenside Colliery are given in **Table 13 and 14**. The Records cover the period from 1948 until 1996.

The MAP measured at the rainfall stations situated within the B1A, B1C and B2C rainfall zones is presented in **Table 13** below.

Table 13: Mean Annual Precipitation measured at the rainfall stations present within the B1A, B1C and B2C rainfall zones as demarcated by the WRC

Details of the stations used		MAP (mm)
Number	Name	
B1A		
0477772	Leslie	703.8
0478008	Cologne	694.7
0478093	Ogies*	748.7
0478292	Langsloot	697.9
0478386	Tweedraai	664.4
0478406	Kriel	629.6
0478546	Vandyksdrift*	695.8
0478837	Bethal	735.4
0479104	Weltevreden	726.8
0479225	Vlaklaagte	680.7
0479238	Brakfontein	718.8
0479348	Tevreden	699.0
0515270	Waterpan*	704.3
Average MAP		**700.0**
B1C		
0478546	Vandyksdrift*	695.8
0515079	Kleinwater*	660.9
0515155	Waterval*	681.0
0515196	Riverside*	659.9
0515234	Clewer*	737.1
0515382	Witbank**	704.9
0515386	Landau	689.2

Details of the stations used		MAP (mm)
Number	Name	
0515412	Witbank**	715.9
0515732	Botsabelo	695.7
0515826	Middelburg	710.6
0516096	Vancouver	714.0
0516190	Bankfontein	688.0
Average MAP		**696.1**
B2C		
0478093	Ogies*	748.7
0514452	Delville	615.7
0514618	Wilgerivier	701.6
0515079	Kleinwater*	660.9
0515155	Waterval*	681.0
0515196	Riverside*	659.9
0515234	Clewer*	737.1
0515270	Waterpan*	704.3
0552029	Verena	647.6
Average MAP		**684.1**

** Note: MAP is determined from stations within the rainfall zone as well as some outside of the rainfall zone, resulting in repetition of the use of some stations in these calculations.*

*** Note: The name Witbank is assigned to two different weather stations (refer also to station number).*

3.2.2.2 Monthly rainfall

The mean monthly rainfall for the B1A, B1C and B2C rainfall zones relevant to the Greenside Colliery is presented in **Table 14** below.

Table 14: Rainfall as a percentage of MAP per month and in mm for Rainfall Zones B1A, B1C and B2C as demarcated by the WRC

Month	Adjusted average monthly % rainfall			Monthly precipitation in mm		
	B1A	B1C	B2C	B1A	B1C	B2C
January	17.21	17.26	17.63	120.5	120.1	120.6
February	13.06	13.20	13.34	91.4	91.9	91.3
March	10.98	11.44	11.58	76.9	79.6	79.2
April	6.39	6.55	6.47	44.7	45.6	44.3
May	2.62	2.51	2.51	18.3	17.5	17.2
June	1.22	1.20	1.27	8.5	8.4	8.7
July	1.09	1.04	1.04	7.6	7.2	7.1
August	1.14	1.02	1.00	8.0	7.1	6.8
September	3.46	3.42	3.18	24.2	23.8	21.8
October	10.54	9.70	9.86	73.8	67.5	67.5

Month	Adjusted average monthly % rainfall			Monthly precipitation in mm		
	B1A	B1C	B2C	B1A	B1C	B2C
November	16.63	16.80	16.25	116.4	116.9	111.2
December	15.65	15.86	15.88	109.5	110.4	108.6

3.2.3 Maximum rainfall intensities

Maximum rainfall intensities for 1:5 to 1:100 year expected values are presented in **Table 15** below. Values given are for 24 hour rainfall periods for O.R Thambo International Airport (closest full weather office to the proposed site); the data was collected over a 51 year period from 1953 to 2004.

Table 15: Extreme values for 24 hour rainfall periods for O.R Tambo International Airport (South African Weather service)

Month	1:5 yrs	1:10 yrs	1:15 yrs	1:20 yrs	1:25 yrs	1:50 yrs	1:100yrs
January	46.4	56.3	61.9	65.8	68.8	78.1	87.3
February	43.5	52.7	57.8	61.5	64.3	72.9	81.4
March	43.5	54.1	60.0	64.2	67.4	77.3	87.1
April	27.1	33.7	37.5	40.1	42.1	48.3	54.5
May	16.4	21.8	24.9	27.0	28.7	33.8	38.9
June	8.3	11.2	12.8	14.0	14.9	17.6	20.3
July	4.7	6.5	7.5	8.2	8.7	10.4	12.0
August	6.8	9.2	10.5	11.5	12.2	14.4	16.6
September	23.4	31.2	35.7	38.8	41.2	48.6	55.9
October	41.8	52.7	58.8	63.1	66.5	76.7	86.8
November	41.4	50.8	56.0	59.7	62.6	71.3	80.0
December	39.0	47.4	52.1	55.4	57.9	65.7	73.5
Annual	**70.6**	**82.0**	**88.4**	**92.9**	**96.4**	**107.1**	**117.7**

Maximum rainfall intensity of 194 mm was recorded in Ogies for a 24 hour period in February 1990. The highest rainfall in 24 hours recorded at Delmas between 1984 and 1990 was 72 mm on 30 November 1984. At Bethal, 88 mm were recorded on 27 February 1981. Thunderstorms are frequent during the rainy season and are usually accompanied by lightning, heavy rain, strong winds and sometimes hail. Hail can be expected to occur on an average of 6 days per year.

3.2.4 Mean monthly evaporation

According to the WRC Report No 298/1.2/94, dated 1994, the catchments relevant to the Greenside Colliery fall within the 4A Evaporation Zone, as defined by the WRC. The mine boundary area for the Greenside Colliery falls within an area with an average Mean Annual Evaporation (MAE) of 1700 mm (S-Pan).

Maximum evaporation occurs in summer, from September to January, due to high summer temperatures. When mean annual evaporation is compared to rainfall, it can be seen that there is a net monthly deficit throughout the year, which results in an annual water deficit of 990 mm.

Table 16: Mean monthly evaporation

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Total
S Pan %	10.8	10.2	11.2	11.0	9.2	9.1	7.0	5.9	4.8	5.2	6.9	8.9	**100**
S Pan (mm)	183	173	190	187	156	154	118	100	81	89	117	152	**1700**
Lake evap. (mm)	148	142	158	157	137	136	104	87	69	74	95	123	**1430**

The mean annual lake evaporation is 1 430 mm with monthly extreme values of 158 mm (maximum) in December and 69 mm (minimum) in June. These figures are for clean water and should be verified and reduced accordingly for water of high salinity.

3.3 Topography

3.3.1 General

The topography for the Province of Mpumalanga is predominantly characterised by an undulating plateau with several valleys incising the plateau. The average elevation of this area varies between that of 1400 to 1600 metres above mean sea level (mamsl).

3.3.2 Site specific

Greenside Colliery is situated on the Mpumalanga Highveld. The proposed site for the new discard facility is located to the south of the existing operations and abuts onto the existing 3A open pit of Kleinkopje Colliery. The North area of the proposed site is characterised by gentle undulating platue which varies between 1600 mamsl in the south and 1540mamsl in the north. The lowest point is at 1540 mamsl where the extreme north of pit 3A of Kleinkopje approaches the Greensidespruit.

The southern edge of the proposed site runs roughly along a minor watershed. The proposed site thus has no streams running onto the site. The Greensidespruit does however begin on the site and bisects the site, flowing from the south to the north. The Greensidespruit begins at a stream that feeds a small wetland area and the three constructed dams before passing under the N12 and into a steam diversion on the existing operations at Greenside Colliery. The Greensidespruit flows into the Naauwpoortspruit within approximately four kilometres. The Naauwpoortspruit in return flows into the upper section of the Witbank Dam.

3.4 Soil

3.4.1 General

Ten types of soils have been identified at the Greenside Colliery. These soils were identified through the analysis of the historic open cast pits on site. The ten soil types identified are:

- Hutton
- Clovelly
- Glencoe
- Griffin
- Dresden
- Avalon
- Longlands
- Witbank
- Westleigh
- Mespah

3.4.2 Site specific

A grid base soil survey of the proposed site was completed in September 2001 (ARC ISCW Report No. GW/A/2001/43). The survey was carried out on a 150x150 meter grid using a hand held auger to a maximum depth of 1.5 metres. Soils were classified according to the South African Soil Classification System (1991).

The soils presented on the site are typical of the Highveld catena with deep red apedal strctureless soils (Hutton, Bainsvlei) present on the upper slope with an average dept of 1000mm, yellow and brown soils (Clovelly, Griffen, Glencor, Avalon) of shallower depth (approximately 750mm), on the mid and lower slopes. Soils towards the base slope become beached sandier and grey (Dresden, Mispah) with an average dept of 500mm.

3.5 Land capability

3.5.1 General

The pre-mining land capability of the surface area of Greenside Colliery was pre-dominantly that of agriculture and grazing. 61% of the surface area was capable of arable production (the growing of crops) with a further 25% of the surface area having grazing potential. The remaining 14% was classified as that of wilderness and wetland areas (WMB, 2002).

3.5.2 Site specific

The pre-mining land capability of the proposed site was pre-dominantly that of agriculture. 63% of the surface area was capable of arable production (the growing of crops) with a further 7% of the surface

area having grazing potential. The remaining 30% was classified as that of wilderness and wetland areas (WMB, 2002).

3.6 Land use

3.6.1 Pre-mining Land Use

The pre-mining land use of the site was predominantly that of agriculture with 13% of the land being occupied with wetlands, dams and pans. The arable areas to the east and west of the proposed site are actively cropped, with dry land maize constituting the principle crop. Open grassland areas (both natural veld and rehabilitated areas) are grazed at a low intensity. The south central portion of the site is derelict on account of past, unrehabilitated, opencast activity. A large portion of the area within the eastern portion of the site is currently under a mixed wattle / grassland community. To the south, the density of wattle is such that the grazing value of the land is currently lost. About 72% of the proposed site has arable potential. Much of the arable land within the site will be lost due to the proposed new discard facility project.

3.6.2 Evidence of Misuse

As noted in the original EMPR, evidence of minor soil erosion in the cultivated areas exists. The central and eastern portion of the site is however heavily infested with black wattle. A large portion of the site has been impacted on by past opencast mining.

3.7 Vegetation

3.7.1 General

The vegetation type of the area in which Greenside Colliery falls is that of veld type 61 as described by Acocks. This type of vegetation is commonly known as the eastern Bankenveld variation or moist sandy Highveld grasslands. The eastern Bankenveld variation is characterised by gently rolling terrain, sandy soil and sparsely tufted sourveld. These Highveld grasslands mainly consist of: *Tristachya leucothrix, Eragrostis racemosa, Heterpogon contortus, Panicum natalense* and *Elionurus muticus* grass species.

3.7.2. Site specific

The proposed site has been utilised for agriculture, mining and forestry purposes in the past and is not in a pristine state. The central parts of the site are heavily infested with black wattle that is encroaching into the grassland areas. Similarly in areas disturbed by past mining activity wattle trees are abundant. In these disturbed areas other exotic species such as pampas (*Cortaderia jubata*) and wild tomato (*solanum cyssimbrifolium*) are common. A portion of the site has also been planted to *Eucalyptus* trees for past commercial benefit.

No threatened, sensitive, endangered or protected species have been identified at the Greenside Colliery. However, two species of orchids, namely, *Eulophia cooperi* and *Neobolusia tysonii* may occur along the Naauwpoortspruit, its tributaries and the Greensidespruit.

3.8 Animal life

3.8.1 General

In general, the mining activities and pre-mining agricultural activities have been found to have disturbed the animal life in the vicinity, with little animal occurring in the vicinity of the site.

3.8.2 Site specific

3.8.2.1 Recorded Species

3.8.2.1.1 Mammals

The Slender Mongoose, Scrub Hare, Duiker and Genets have been found to occur on-site of the Greenside Colliery.

3.8.3.2.2 Birds

The birds that have been found to occur at the Greenside Colliery are those of; the Crowned Plover, Blacksmith Plover, Cape Turtle Dove, Black Headed Heron, Fiscal Shrike and Graminivores such as Red Billed Quelea, Black Throated Canary and Yellow Eyed Canary.

3.8.3 Threatened Species

No threatened or endangered species occur on or within the vicinity of the Greenside Colliery.

3.9 Surface Water

3.9.1 General

A report titled '*Greenside Colliery: Surface and groundwater quality assessment report',* dated November 2010 and compiled by Clean Stream Scientific Services, describes the sampling methodology, procedures as well as water quality results for the Greenside Colliery. Water samples obtained from the various sampling localities at Greenside Colliery is analysed by the Anglo Coal Central Laboratory situated in Emalahleni.

3.9.2 Site specific

3.9.2.1 Water Management Area

In general, the mine boundary area is located in the headwaters of the Naauwpoortspruit, the origin about 2 km west of the mine boundary area. The Naauwpoortspruit flows into the eMalahleni Dam 15 km east of the mine boundary area. A tributary of the Naauwpoortspruit, the Greensidespruit, originates in the mine

boundary area. Greenside Colliery is situated within the, primary catchment B (Olifants River Catchment area), secondary catchment B1 and B2, quaternary catchments B11F, B20G and B11G.

The Upper Olifants River Catchment is located on the eastern Mpumalanga Highveld and drains a total catchment area of 3 446 km² to the eMalahleni dam. The catchment is characterised by diverse land use including urban development, agriculture, power generation and coal mining. The catchment mainly drains along the river valleys of the Olifants River and Steenkoolspruit. Several tributaries including the Trichardtspruit, Vaalbankspruit, Rietspruit, Saaiwaterspruit, Boesmanskransspruit and the Naauwpoortspruit drain into these two major drainage valleys. Greenside Colliery falls within Management Unit 6 of the Olifants Water Management Area.

Table 17 below summarises the information pertaining to these quaternary catchments (WRC, 1994).

Table 17: Quaternary catchment information for the catchments associated with the proposed Greenside Colliery (WRC, 1994)

Catchment	B11F	B11G	B20G
Gross area (km^2)	428	368	522
Net area (km^2)	428	368	522
Irrigation area (km^2)	0.7	-	4.6
Evaporation Zone	4A	4A	4A
MAE (mm)	1600	1600	1700
Rain Zone	B1A	B1C	B2C
MAP (mm)	692	693	669
MAR (mm)	34	36	44
MAP-MAR Resp	8	8	7
NET MAR (10^6m^3)	14.7	13.2	23.0
Gross MAR (10^6m^3)	14.7	13.2	23.0
CV	0.849	0.772	0.586
Hydro zone	L	L	J

3.9.2.2 Surface Water Hydrology

The mine is located in the headwaters of the Naauwpoortspruit and drains a catchment area of 36.51 km2. The origin of the Naauwpoortspruit is about 2 km west of the mine. The Naauwpoortspruit flows into eMalahleni Dam some 15 km east of the mine. The Greensidespruit is a tributary of the Naauwpoortspruit, and originates on the mine site. The majority of the area contributing runoff to the Greenside catchment lies upstream of the mine complex.

The Naauwpoortspruit sub catchment contains various pans and small dams which have a major impact on the natural flow of water within the catchment. The construction of the N12 highway between

Johannesburg and eMalahleni across the sub catchment modified the natural flow routes of two tributaries located at the headwaters of the Naauwpoortspruit sub catchment. The natural flow of water is channelled through culverts and during floods water will dam up behind the elevated highway.

The Greensidespruit was diverted in 1983 to flow around the waste dump at Greenside Colliery.
Two pans are located in the mine boundary area, one in the northern corner (Clydesdale pan) and one in the south of the mine boundary area (Berry's Pan). The surface infrastructure area for Greenside Colliery does not affect these pans, although Greenside Colliery proposes to undermine the Clydesdale Pan and have obtained regulatory approval. The Greenside Colliery mine infrastructure area and its locality relative to these pans can be seen in **Plan 8** in **Appendix A**.

3.9.2.3 Surface Water Quality

In the development of the Water Quality Management Plan for the Upper Olifants River Catchment, water quality guidelines and objectives have been set at various control points in the Management Units. The water quality guidelines and sulphate water quality objective for the Naauwpoortspruit Management Unit 6 is given in **Table 18**.

Table 18: Water Quality Guidelines and Sulphate Water Quality Objective

Water quality variable Units Guideline	
pH (mS/m)	6.5-9
Boron (mg B/l)	2
Fluoride (mg F/l)	1
Potassium (mg K/l)	50
Iron (mg Fe/l)	1
Water quality variable Units Guideline	
Manganese (mg Mn/l)	0.5
Aluminium (mg Al/l)	0.1
Sulphate water Quality management objective	
50 percentile (mg SO_4/l)	260
95 percentile (mg SO_4/l)	380

Clean Stream Scientific Services conducted a Surface and Groundwater Quality Assessment Report in November 2010, attached hereto in **Appendix E**.

Sampling at Greenside Colliery was performed according to recognised procedures as prescribed in the Minimum Requirements for Water Monitoring at Waste Management Facilities (DWAF, 1998). Surface water monitoring localities identified on relevant surface watercourses and at sewage treatment sites on and within the vicinity of the mine are sampled once every month.

The positions of the surface water quality monitoring points are shown in **Table 19.**

Table 19: Surface water monitoring localities at Greenside Colliery

Surface Water Monitoring Localities - Greenside					
Potable Water Monitoring Localities					
Site Name	**X**	**Y**	**Z**	**Site**	**Description**
POT02	17506.46	-2872548.23	1606.50	S	Potable water from Municipal tank
POT06	18437.09	-2872904.06	1557.13	S	Potable water from House in village
WP126	17595.27	-2872227.25	1551.64	S	Village swimming pool
Soap, Oil and Grease Water Monitoring Localities					
Railway 1	17662.50	-2871586.78	1540.48	S	Stormwater runoff from plant into trench
Railway 2	17611.78	-2871614.80	1542.90	S	Runoff from workshops and stores into trench
Railway 3	17677.68	-2871663.55	1543.34	S	Shaft runoff into trench
WP122	17493.40	-2871904.17	1547.32	S	Daylight shaft oil trap
WP123	18288.79	-2871641.33	1542.79	S	Bulkmech oil trap
WP124	18095.06	-2871714.37	1543.33	S	Transport workshop silt trap
WP125	18491.50	-2871802.94	1542.90	S	Fitter shop oil trap
WP127	18315.27	-2871619.67	-	S	Oiltrap behind Salvage Yard
WP128	17642.07	-2871789.60	-	S	Oiltrap at Lamproom
Receiving Water Monitoring Localities					
WP012a	19560.93	-2870692.09	1530.23	S	Surface water leaving Greenside
WP012b	19915.79	-2870500.62	1531.50	S	Surface water leaving Greenside
WP100	16461.22	-2872530.49	1548.52	S	Upper reaches of Naauwpoortspruit
WP101	16846.30	-2872450.56	1550.38	S	Smaller golf course dam
WP102	17366.09	-2871346.87	1541.09	S	Naauwpoortspruit crosses access road to G/S
WP109	19628.88	-2871365.20	1538.40	S	Naauwpoortspruit crossing N12 stream diversion
WP119	16806.41	-2872297.92	1547.27	S	Big golf course dam in Naauwpoortspruit
Process Water Monitoring Localities					
WP110A	19238.17	-2871675.84	1538.58	S	Pollution control dam 1
WP110B	19225.05	-2871214.02	1534.13	S	Pollution control dam 3
WP111	18267.79	-2871610.58	1542.55	S	Plant Erickson dam 1
WP112	18293.48	-2871608.35	1542.40	S	Plant Erickson dam 2
WP113	19560.91	-2870692.08	1530.23	S	2 Seam water supply to dam 1
WP114	17023.99	-2873495.16	1565.99	S	Inflow from 2 Seam into Ntshonolanga dam
WP115	17040.57	-2873449.56	1566.20	S	Outflow from Ntshonolanga to Shaft Erickson dam
WP116	19094.17	-2872656.94	1546.23	S	Penstock outflow into trench

WP117	18517.75	-2871928.63	1546.93	S	Erickson dam at the shaft
WP118	17481.47	-2871928.36	1546.98	S	Treated sewage water holding dam
WP120	18671.94	-2871319.72	1536.87	S	Lake Lucy (Plant area pollution control dam)
WP121	18546.29	-2871634.85	1541.41	S	Y2K (Dam catching overflow from Lake Lucy)

According to the Surface and Groundwater Quality Assessment Report, dated November 2010, the village swimming pool locality (WP126) exceeded the DWAF Tolerated Water Quality Guideline Ranges (TWQGR) for manganese (Mn) and suspended solid (SS) concentration. The recorded average manganese concentration only has a slight health risk should it be consumed. Very little health risk is expected should the water only be used as a recreational sources i.e swimming. Health risks associated with the suspended solids are also limited to the presence of bacteria in the water. It is recommended that the village swimming pool also be analysed for bacterial (E coli) content to determine safeness of use.

The pollution control dam localities (WP110a, WP110b, WP120, and WP121) all indicate high salinity (EC / Total Dissolved Solids (TDS)) concentrations coupled with elevated calcium, magnesium, sulphate, manganese and suspended solid concentrations. The STIFF diagrams indicated water qualities dominated by the sulphate anion (which is typical of coal mine polluted water).

Two of the Erickson dam localities (WP111, WP112) indicate high salinity (EC / TDS) concentrations coupled with elevated calcium, magnesium, sulphate, manganese and suspended solid concentrations. The Erickson Dam at the Shaft indicates good water quality conditions with all variables compliant with the domestic use standards. The STIFF diagrams indicated water qualities dominated by the sulphate anion (which is typical of coal mine polluted water).

The treated sewage water locality (WP118) indicates good water quality conditions with all variables compliant with the domestic use standards. It is however recommended that the sewage water locality also be analysed for nitrates, phosphates, ammonia, and chemical oxygen demand to ensure that treatment is adequate.

The remaining process water localities (WP113, WP114, WP115, and WP116) all indicate high salinity (EC / TDS) concentrations coupled with elevated calcium, magnesium, sulphate, manganese and suspended solid concentrations (which is typical of coal mine polluted water).

Soap, Oil and grease monitoring is done at selected process water localities. Soap, oil, and grease results are not measured at regular intervals. It is recommended to do the monitoring at regular intervals to ensure accurate values are recorded, as well as to minimise the opportunity to miss spill events. Localities WP120, WP122, WP124, and WP125 all have highly elevated soap oil and grease content, indicating that the oil separator might not be working effectively, or that the capacity of the separator is too small to handle the volumes of water to be treated.

The upstream Naauwpoortspruit monitoring locality (WP100), is still unaffected by the Greenside Mining activities as the water quality still complies with the DWAF target water quality guideline for domestic use. As the Naauwpoortspruit flows past the Greenside Operation, it is clear that the sulphate component in the water quality composition becomes more evident (See STIFF diagrams for localities WP102 and WP109). Sulphate is often a clear indicator of coal mine water pollution, and the increasing sulphate concentrations in the Naauwpoortspruit towards the downstream environment would indicate an impact from the Greenside Colliery operation on the Naauwpoortspruit.

Localities WP012a and WP012b indicate water with high salinity, sulphate, and manganese concentrations (coal mine pollution indicators). These water qualities also drain towards the Naauwpoortspruit, and would adversely affect the water quality of the spruit. No downstream locality on the Naauwpoortspruit, form these two localities exist, so it is not possible to comment on the extent of the impact. It is recommended to include for a downstream locality on the Naauwpoortspruit to quantify the impact from these two localities.

3.9.2.4 Mean Annual Runoff (MAR)

As indicated in the Water Use Licence Application dated 2004 and compiled by Golder Associates, the Mean Annual Runoff (MAR) for the whole Upper Olifants River Catchment was estimated at 122 million m^3 per annum with the use of a calibrated Pitman model.

The MAR from the Catchments was calculated from the yearly output and is given in **Table 20** below.

Table 20: Mean Annual runoff computed

Location	Area (km^2)	Winter base flow (10^6 m^3/ annum)	MAR (10^6 m^3/ annum)
Witbank Dam	3302	31,07	122,14
Naauwpoortspruit	91	0,85	3,08
Greenside Colliery	37	0,34	1,24
Upstream of mine	32	0,30	1,08

The dry weather flow (April to September) for the Olifants River catchment was calculated 31, 07 million m^3 per annum (26% of the MAR). The corresponding base flow for the Greenside sub catchment is estimated at 0.34 million m^3 per annum.

The flood peaks and associated flood volumes were calculated for a point on the Naauwpoortspruit immediately downstream of the Greenside Colliery and are as listed in **Table 21**.

Table 21: Calculated flood Peaks and Volumes

Return Period	1:20			1:50			1:100		
Catchment	Peak m^3/s	Vol. m^3	Time min	Peak m^3/s	Vol. m^3	Time min	Peak m^3/s	Vol. m^3	Time min
Naauwpoortspruit	25	343 200	393	55	660 200	340	75	762 500	304

3.9.2.5 Resource Class and River Health

In South Africa, a river health classification scheme is used to standardise the output of different river systems. The document titled "*Resource Directed Measures for Protection of Water Resources: River Ecosystems Version 1.0.24"*, dated September 1999, compiled by the DWA, provides the indexes of Attainable Ecological Management Classes (AEMC) as shown in **Table 22** below.

Each index is calibrated so that its results can be expressed in terms of ecological and management perspectives.

Table 22: Resource classes as set out by the DWA

River Health Class	Ecological perspective	Management perspective
Natural / Excellent (Class A)	No or negligible modification of in-stream and riparian habitats and biota.	Protected rivers; relatively untouched by human hands; no discharges or impoundments allowed.
Good (Class B)	Ecosystems essentially in good state; biodiversity largely intact.	Some human-related disturbance but mostly of low impact potential.
Fair (Class C)	A few sensitive species may be lost; lower abundances of biological populations are likely to occur, or sometimes, higher abundances of tolerant or opportunistic species occur.	Multiple disturbances associated with need for socio-economic development, e.g. impoundment, habitat modification and water quality degradation.
Poor (Class D)	Habitat diversity and availability have declined; mostly only tolerant species present; species present are often diseased; population dynamics have been disrupted (e.g. biota can no longer reproduce or alien species have invaded the ecosystem).	Often characterised by high human densities or extensive resource exploitation. Management intervention is needed to improve river health – e.g. to restore flow patterns, river habitats or water quality.

The DWA initiated the design and implementation of a National River Health Programme in 1994. The programme was designed to expand the ecological information available for managing rivers in South Africa. It provides a systematic framework for quality controlled collection and assessment of river health data, and for reporting on the results.

Information on the resource class and river health of water resources in the receiving environment of the Greenside Colliery is not yet available.

3.9.3 Receiving Water Quality objectives and the reserve

Each ecological class, as indicated in **Table 22** above, has a set of flow and water quality eco-specifications, which define its objectives. Different user impacts are associated with each ecological class. The final management class objectives are Resource Quality Objectives (RQO's), which are made up of eco-specifications and appropriate user-specifications. Sustainability is achieved when management actions result in the in stream RQO's for the selected class being met.

According to the document titled: "*Environmental water quality in water resource management*", dated 2004, compiled by the WRC, a detailed ecological Reserve assessment for water quality of the Olifants River was conducted.

There are some 40 monitoring points in the upper Olifants catchment. Of these, 25 are situated in the Olifants and Klein Olifants River catchments upstream of the Wilge River confluence. Eleven are situated in the Wilge River catchment, and one monitoring station is situated between the Wilge River confluence and the inflow into the Loskop Dam (WRC, 2004).

The DWA Target Water Quality Guidelines for aquatic ecosystems provided guidelines for single-substance toxicants on the basis of toxicity test results, but for salinity the guideline was that it should not exceed 15 % of the "natural" range.

A reference or "natural site" and an impacted or "present day" site in each water quality reach in the Olifants River was identified as part of the afore-mentioned assessment. The median monthly TDS concentration was compared between the reference and the impacted site and the percentage difference noted. A preliminary guide was suggested that the percentage difference (as indicated in **Table 23** below), would relate to specific classes.

Table 23: Percentage deviation from the natural condition i.t.o. salinity

Ecological Health Class		Salinity - % deviation from the natural (Class A) condition
A	Excellent	15
B	Good	20
C	Fair	30
D	Poor	40

When this was applied to the Olifants River salt data, nearly all the reaches had to be classified as "Poor". Most of the recorded salinities at impacted sites had been more than 40 % higher on average than they would have been in the natural state.

South African Scoring System (SASS) scores (biomonitoring) were also related to classes for the Olifants River (refer to Table 24 below for the results thereof).

Table 24: Total SASS score and average per taxon (ASPT) related to river classes

Class	SASS score	ASPT
Excellent	> 175	> 7
Good	120 - 175	6 - 7
Fair	60 - 120	4.8 – 5.9
Poor	< 60	< 4.8

When the biomonitoring results were assessed, it was clear that while there were reaches in which the biological indicators showed a "Poor" class, there were also reaches in each of the other classes. This indicated that 40 % salinity increases above the natural were within the tolerance limits of many fish and invertebrates. In addition, a large number of nymphs of the mayfly *Tricorythus discolour* were collected from a reference site in the Upper Olifants River and, using sodium sulphate as a model for mining-influenced salinisation, a series of salt tolerance tests were undertaken. Refer to **Table 25** below for the results.

Table 25: Relationship between river class and salinity for river reaches in the Olifants study area

Assessment class	Electrical conductivity (mS/m)	Total dissolved salts (mg/l)
A	20 - 35	130 - 195
B	35 - 45	195 - 295
C	45 - 80	295 - 520
D	80 - 120	520 - 780
E/F	> 120	> 780

It was apparent that there were a few resource units where the biomonitoring indicated a "Poor" condition even though the salinity was "Good" (WRC, 2004). The land use around the resource units with a "Poor" biomonitoring status was assessed and those units where mining or intensive agriculture activities were / are undertaken were noted. The toxicity of the river water in those resource units was tested, and in two instances the river water was found to be toxic.

It was suggested as part of the afore-mentioned document that a combination of water chemistry, biomonitoring and eco-toxicology be routinely used as part ecological Reserve assessments.

Greenside Colliery will comply with all requirements of the DWA regarding the class objectives for the river systems and streams situated within and surrounding the Greenside Colliery mine boundary area.

3.9.4 Surface Water User Survey

There are no major water users in the Naauwpoortspruit and its tributaries. However, the Witbank Dam into which water from the Naauwpoortspruit drains is a water body of economic importance and hence,

any potentially adverse effect of the Naauwpoortspruit on economic attributes of the Witbank Dam is regarded as important. .

Surface water user survey information was not available during the compilation of this document, however numerous users however bound to occur within the immediate vicinity of the mine infrastructure area as the area is surrounded by active farms and farming communities.

3.9.5 Sensitive areas survey

As indicated in the Water Use Licence Application, dated 2004 and compiled by Golder Associates, the Naauwpoortspruit flows along a wide shallow valley, comprising mainly turf, subtended by sandy slopes at a distance of the stream. The valley of the Greensidespruit is steeper with clay soils at the bottom of the spruit and more sandy soils along the upper slopes. The valley associated with the Nauuwpoortspruit is also more open and less marshy that that of the Greensidespruit. In general grassland extends to the respective edges of the streams, with few wetland vegetation species present. At confluence of the two steams, the construction of roads has created artificial wetland conditions causing impoundment of water and/or retardation of flow, creating a marshy area dominated by bulrushes.

There are several drainage channels with associated pans and wetlands running through the site. These were noted as important habitats for many species of birds and animals. It is possible that rare species of birds and animals could inhabit and visit these wetlands.

The Document entitled: “Upper Olifants River Catchment Wetland Management Strategy”, dated 2007 and compiled by Oryx Environmental indicates the wetland status of the wetlands associated with quaternary catchment B20G, B11G and B11F.

Quaternary B11F has a Present Ecological Status (PES) score of E, a low Ecological Importance and Sensitivity (EIS) and an Ecological Management Class (EMC) score of D. Approximately 18% of the non-floodplain riparian and 40% of the seepage wetlands are in a D class. 89% of the Floodplain riparian wetlands are in a B class. The emphasis in this quaternary should be on preserving the wetlands in a B or C class.

Quaternary B11G has a PES score of E, a low EIS and an EMC score of D. 29% of the non-perennial pans are in an E class as well as 10.6% of the Seepage wetlands. Nearly 40% of the seepage wetlands are in a D class, as is 11% of the floodplain riparian, 13% of the non-floodplain riparian and 8% of the non-perennial pans. The emphasis in this quaternary should be on rehabilitating wetlands in an E or D class and preserving the wetlands in a B or a C class, particularly the floodplain riparian wetlands since a large proportion of these wetlands are in a B class and they contribute to a large proportion of the area of wetlands in the quaternary.

Quaternary B2GF has a PES score of D, a moderate EIS and an EMC of D. The seepage wetlands are most heavily degraded with 15.71% and 50.44% in the E and D class respectively. 25.87% of the non-

floodplain riparian wetlands are in a D class. 100% of the floodplain riparian wetlands are in a C class. The emphasis in this quaternary should be on the rehabilitation of the seepage and non-floodplain riparian wetlands and avoiding the degradation of the floodplain riparian and remainder of the non-floodplain riparian wetlands.

3.10 Groundwater

3.10.1 General

A report titled '*Comprehensive assessment of groundwater monitoring program: Anglo Coal Greenside Colliery*' dated November 2010 and compiled by Groundwater Complete, assesses the groundwater monitoring program utilised by Greenside Colliery (attached in **Appendix E2**). The report also includes an evaluation of the latest groundwater quality and water level conditions. The report indicates that the existing Co-disposal facility and all small dumps and stockpiles are considered to be the most significant source of groundwater contamination. The plant area, surface water management infrastructure, workshops and washbays are the other main sources groundwater contamination.

3.10.2 Site specific

3.10.2.1 Aquifer characterisation

As indicated in the Water Use Licence Application, dated 2004 and compiled by Golder Associates , three aquifers are developed in the region of Greenside Colliery, which are as follows:

- The shallow perched water aquifer.
- The deeper fractured rock aquifer system formed by fractures in the underlying Vryheid formation.
- Coal seam aquifers within the sedimentary succession.

The deeper fractured rock aquifer is largely dewatered by the mining activities. The coal mines in the area have impacted on the groundwater quality in the fractured rock aquifer, and the perched aquifer to a lesser extent. The three aquifers found in the area are considered to be minor aquifers. However, the weathered or perched aquifer has local importance as water supply to farming community. Abstraction takes place from depths of approximately 30 metres, but at low rates (≤ 1 l/s).

The extent of the affected groundwater was determined with the aid of the numerical groundwater model constructed for Greenside Colliery (GCS, 1999). Current and past mining activities have lowered groundwater levels at Greenside Colliery. It was estimated that groundwater has been lowered by between 13 and 37 meters along the northern boundary of the mine. Groundwater levels have been lowered to below the No.4 Seam in most areas. Along the northern boundary with Groundwater levels have been lowered to below the No.4 Seam in most areas. Along the northern boundary with Landau Colliery, groundwater levels have been lowered into the No.2 Seam workings (Golder, 2004).

Underneath the Clydesdale Pan the No. 5 seam has been mined previously and the workings are currently flooded.

3.10.2.2 Groundwater quality

An assessment of the groundwater monitoring program for Greenside Colliery was conducted by Groundwater Complete in November 2010 an attached hereto in **Appendix E2.**

Though numerous boreholes are indicated on the database, very few are actively monitored on a consistent frequency. The monitoring boreholes sampled during 2009 and 2010 are all located far down gradient of the potential sources of groundwater contamination. Boreholes GUW2, GUW5 and GUW7 are the exceptions as they are located up gradient of the Greenside mining activities.

The majority are however not located directly down gradient of potential sources of groundwater contamination. The positions of the existing monitoring boreholes are indicated in **Figure 2.**

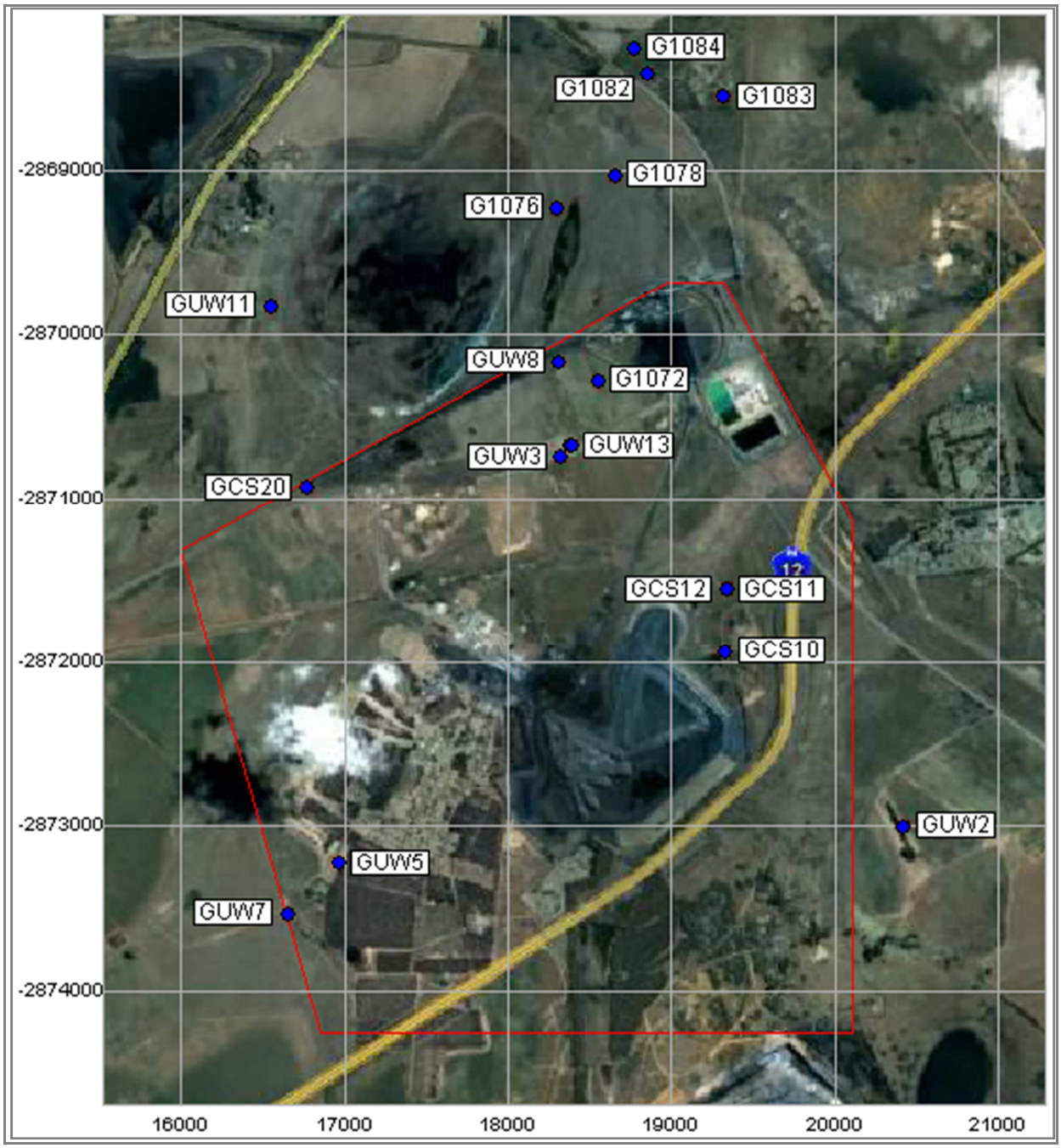

Figure 3: Positions of existing groundwater monitoring localities

Quarterly sampling runs are currently being conducted at Greenside, but gaps are left in the data records mainly due to the fact that the groundwater monitoring localities are not properly maintained. Such gaps lead to inconsistencies and the inability to determine groundwater quality and water level trends.

The current range of indicator parameters is considered to be adequate in the detection of the type of contamination expected to occur at Greenside. Nitrate is however excluded from the current range of parameters. It is strongly recommended that nitrate be added to the list of analytes to enable the use of diagnostic plots and characterization of water type.

Monitoring boreholes SCG10 and SCG12 indicated severe negative groundwater quality impacts, resulting from poor quality seepage emanating from the discard dump and pollution control dam 1.

Groundwater measured in the underground void (as measured in monitoring boreholes GUW07, G1082 and G1083) is of poor quality, with indicator chemical parameters all exceeding the maximum permissible concentration.

The overall dominance in sulphate anions is a clear indication of sulphate contamination, which is most severe in groundwater monitoring boreholes GCS10, GCS12, GUW7, G1082 and G1083.

The majority of groundwater levels are affected by mine dewatering to the extensive underground mine void areas.

3.10.2.3 Hydrocensus

User information was not available during the compilation of this document. Numerous groundwater users are however bound to occur within the immediate vicinity of the mining activities as the mine is surrounded by active farms and farming communities. Such users/receptors are highly sensitive to groundwater contamination emanating from potential sources at Greenside Colliery.

As mentioned previously, the current distribution of groundwater monitoring localities is considered to be insufficient. The majority of existing localities could rather be described as being regional groundwater monitoring boreholes. The vast majority of existing monitoring boreholes could be classified as being far down gradient plume monitoring boreholes, with source monitoring being virtually non-existing. Additional monitoring boreholes are therefore strongly advised.

Monitoring boreholes were sited down gradient of expected sources of groundwater contamination, and on geological dykes where possible. It might be worthwhile to firstly determine whether existing monitoring boreholes could be reinstated into the monitoring program by either clearing them from possible blockages or by equipping them.

As mentioned previously, geological structures such as dykes are prime targets when siting and drilling groundwater monitoring boreholes. A geophysical survey is strongly recommended prior to drilling in an effort to define known and unknown geological structures, which could act as preferred flow paths for both groundwater and contamination.

3.10.2.4 Potential pollution source identification

3.10.2.4.1 Potential sources of groundwater contamination

Numerous sources of groundwater contamination generally occur within a coal mining environment which each has its own unique effect on the local groundwater chemistry and quality. Such sources can further be divided into two groups, namely point and diffuse sources. Point sources are local sources of

groundwater contamination that are easily identifiable, while diffuse sources are distributed over a large area and may be a collection of different sources. Point source contamination is most commonly associated with surface mining activities while the underground mine workings can typically be described as a diffuse source. The following potential sources were identified within the Greenside mine lease area:

- The mine discard dump (including all smaller dumps and stockpiles) is considered to be the most significant source of groundwater contamination. Material disposed of at the mine dump has the potential to generate high concentrations of both sulphate (as a result of acid mine drainage) and nitrate (due to the usage of nitrate based explosives). Contamination is therefore expected to originate as poor quality seepage in the north-north/eastern down gradient direction.
- The plant area is also considered to be a significant source of groundwater contamination as a result of various coal washing and chemical processes. Contamination is expected to originate in the form of spillages on surfaces that are not covered by some form of concrete or plastic liners.
- Surface water management infrastructure such as pollution control dams, storm water dams, return water dams, etc. Contamination is likely to originate from such infrastructure in the form of leachate as a result of leakages.
- Groundwater contamination is likely to originate from the shaft area as a result of the extensive usage of nitrate based explosives.
- Workshops and washing bays are more often than not significant sources of organic groundwater contamination, which originates from spillages and the cleaning of mining machinery and vehicles.
- The extensive underground mining void also acts as a diffuse source of groundwater contamination but a water quality impact would only manifest when decant levels are reached or approached.

The identification of all possible sources of groundwater contamination is probably the most important aspect of a comprehensive monitoring program, as well as the first step that should be taken during the design of such a program. Groundwater monitoring boreholes should be sited both up gradient and down gradient of suspected sources of contamination in an effort to distinguish between “incoming” and “outgoing” groundwater quality. The difference between incoming and outgoing quality represents the contribution or impact from the source.

Under natural conditions groundwater movement is expected to follow the surface water drainage directions, which means that any groundwater contamination emanating from the above mentioned sources are expected to migrate towards the north-north/west. Mining voids that are located beneath the local groundwater level will restrict the down gradient movement of groundwater contamination due to the formation of a cone of depression. Groundwater within the radius of the cone of depression will move radially inwards towards the void/s. Such voids are therefore seen as sinks for both groundwater and contamination.

Surface sources, on the other hand, form ‘sources’ of artificial recharge. The water level below these facilities rises (mounding occurs) and hence the flow gradient increases. Due to the increased gradient, seepage rates increase, with associated increase mass transport rates. Such sources in the mining

environment typically include tailings or co-disposal facilities; return water dams, storm water control dams and settling dams in dirty areas.

3.10.2.4.2 Preferred Pathways for Groundwater Contamination

Preferred pathways for both groundwater flow and contamination are zones within the aquifer regime of exceptionally high transmissivity. Such zones are created by intensive weathering of the lithology, or by fracturing in geological structures such as dykes and faults. Dykes are prone to fracture formation along the sides of the structure, which forms a preferred flow path for groundwater. The dyke itself has a very low transmissivity and is therefore a flow barrier for both groundwater and contamination.

Numerous north-east/south-west trending dykes occur within the mine lease area. The positions of some of these dykes are indicated in **Figure 3**.

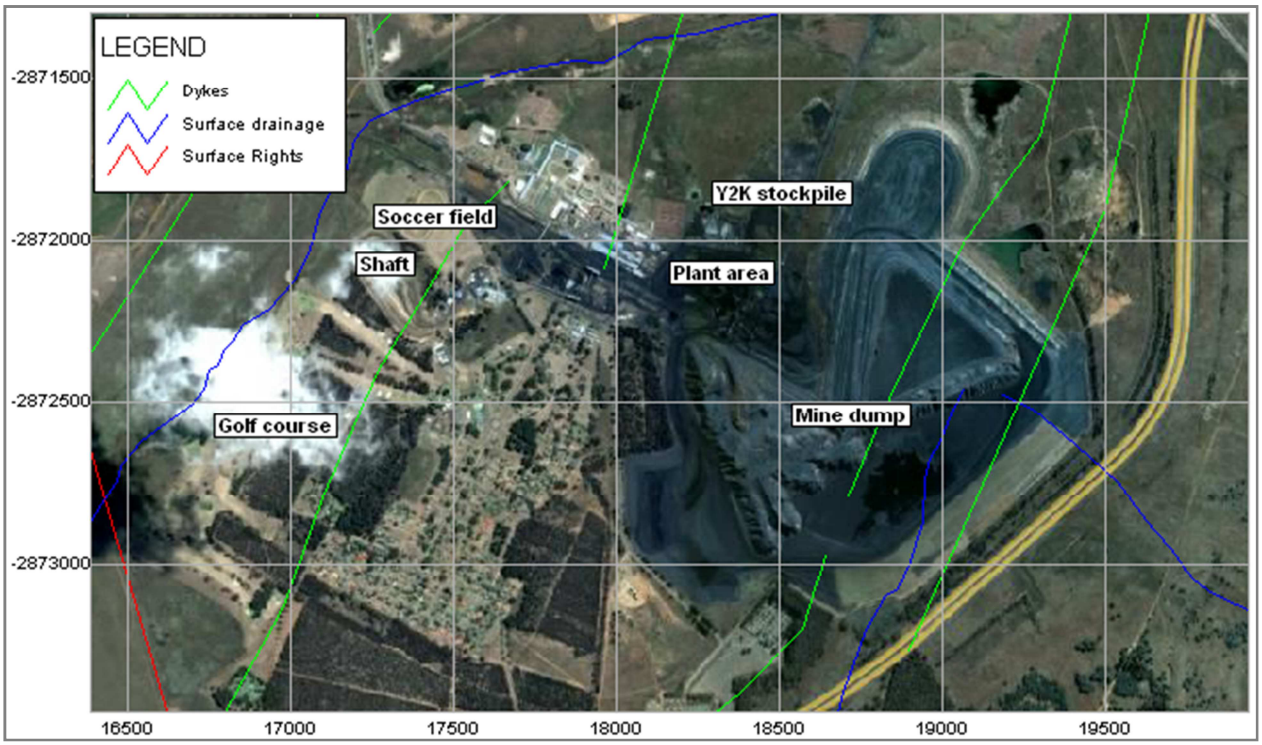

Figure 4: Position of geological dyke

Two prominent dykes are located beneath the mine dump. Contamination emanating from the mine dump is therefore expected to form elongated 'plumes' along the dykes in a north-easterly direction. Such structures are therefore prime targets when siting groundwater monitoring boreholes.

From experience in similar coal mining environments the depth of the weathered zone, which is defined as the area between the land surface and the fresh/unweathered bedrock, varies between 0 and ± 15 meters.

As previously discussed, the high transmissivity of the weathered zone enables it to act as a preferred flow path for both groundwater and contamination, which makes it vulnerable to surface spillages. Any contamination entering the weathered zone will migrate in a north-north/easterly direction.

3.10.2.4.3 Potential receptors of groundwater contamination

Receptors of groundwater contamination are defined as any groundwater users that rely on groundwater as a source of domestic water, irrigation, etc. Sensitive natural fresh water ecosystems (springs, streams, wetlands, pans etc.) are also considered to be important receptors, which needs to be taken into consideration.

During a previously conducted hydrocensus it was determined that numerous groundwater users occur in the far down gradient direction from the Greenside Colliery. Groundwater is utilised for domestic, irrigation and livestock watering purposes. Such users/receptors are highly sensitive for groundwater contamination emanating from potential sources at Greenside.

From this it is clear that numerous sources, pathways and receptors occur within the immediate vicinity of the Greenside Colliery, which may lead to negative groundwater quality impacts. The early detection of migrating groundwater contamination is essential and will be achieved by means of a comprehensive monitoring program.

3.10.2.5 Groundwater model

The extent of the affected groundwater was determined with the aid of the numerical groundwater model constructed for Greenside Colliery (GCS, 1999). Current and past mining activities have lowered groundwater levels at Greenside Colliery. It was estimated that groundwater has been lowered by between 13 and 37 meters along the northern boundary of the mine. Groundwater levels have been lowered to below the No.4 Seam in most areas. Along the northern boundary with Groundwater levels have been lowered to below the No.4 Seam in most areas. Along the northern boundary with Landau Colliery, groundwater levels have been lowered into the No.2 Seam workings (Golder, 2004).

Underneath the Clydesdale Pan the No. 5 Seam has been mined previously and the workings are currently flooded.

Prof. F.D.I. Hodgson developed an extensive model for the continuous measurement of the SACE underground workings water bodies (Attached hereto in **Appendix E3**). The model also represents the surface water use and storage for water management purposes. This model calculates the amount of excess water on the mines, which is related to the Life of Mine for each of the SACE mines.

In order to predict the movement of water and mass in the subsurface, a conceptual geohydrological model of the study area was developed. The basis of such a model is the structural geological make-up of the study area.

The average current water elevation in the 2 Seam at Greenside is 1486.3 mamsl. The 4 and 5 Seam workings at Greenside are not currently monitored.

In the Navigation Area, the average water elevation on the 5 Seam workings is well above 1530 mamsl, as can be seen from the labels at the monitoring points. It is expected that these workings are in equilibrium with water in the Clydesdale Pan. The 5 Seam workings contain about 8 Mm^3 water of which 2 Mm^3 lie underneath the Clydesdale Pan. The stage curve for the Greenside 2 Seam workings suggests that the main water bodies currently contain about 30 Mm^3 water. Additional 2 Mm^3 water could be present in isolated areas. Indications are that the water level on the 2 Seam can be allowed to rise to 1493 mamsl (holding 38 Mm^3) without interfering with 4 Seam operations. This is the lowest elevation of current mine access roads to the north. The next critical elevation is that of Daylight Shaft on the 4 Seam, at approximately 1499 mamsl.

It is expected that the Clydesdale Pan and the 5 Seam workings are interconnected along sinkholes. This would explain the very high water levels (>1530 mamsl) in the 5 Seam workings. The high 5 Seam water elevations contrast with that on the 4 Seam, which is mostly dry. Future interconnectivity between the 4 and 5 Seams could, however, exist in the form of boreholes or even dykes.

It is concluded that the risk of water from the pan reaching the 4 Seams workings, is no greater that the risk of water from the 5 Seam reaching the 4 Seam workings. The current volume of water on the 5 Seam directly underneath the pan is 2 Mm^3. The pan itself has a surface area of 1.6 Mm^2. Assuming an average water depth of 0.33 m over 50% of the pan surface, the pan water amounts to 0.26 Mm^3, which is small compared to the water in the 5 Seam.

Also relevant to mining underneath the Clydesdale Pan Area are:

- The dip of the 5 Seam coal floor underneath the pan is to the south. More water will therefore be drained if an interconnection between the 5 and 4 Seams exists in the south.
- The 5 Seam workings that overly the future 4 Seam operations beneath the pan are flooded to an elevation of 1534 mamsl.

3.11 Air Quality

In 1991, SO_2 and particulate levels for Witbank were found to be below that of the maximum levels set by the Department of Health. In March 2000, the air quality results indicated that dust fallout was insignificant in terms guidelines.

3.12 Noise

3.12.1 General

Although there are agricultural activities to the west of the prosed site the study area is characterised by the presence of major exiting noise sources. There are major coal mining activities at Kleinkopje in the south, Greenside Colliery in the north and Landau I the East. The N12 highway, which crosses the area immediately to the North of the proposed site, carries a large amount of traffic. This includes a very significant amount of heavy vehicles. Other busy roads crossing the area are the R547, the road connecting the R544 and the R547 past Kleinkopje, and the road leading from Kleinkopje, past Landau village to Clewer. Residential areas consist of villages associated with the mines of the area.

Noise levels were expected have significant contributions from the N12 Highway and the other coal mines in the area, and in light of the above, the proposed project is not expected to worsen the noise levels of the study area.

3.12.2 Site specific

Therefore with the general high level of mechanisation in the area, relatively high existing ambient noise may be expected. The current ambient noise levels are characterised by the presence of mining and road traffic related noises. Noise levels at the proposed discard facility are expected to be the same as that of the rest of the Greenside Colliery.

3.13 Sensitive Landscapes

3.13.1 General

Sensitive sites include the drainage channel of the Greensidespruit and associated small wetland areas. These areas are important habitat for species of birds and animals. No rare or endangered species of birds and animals have been recorded previously in these wetlands. The species diversity of the Greensidespruit wetland shows the effect of past mining impacts of mining activities in the area.

3.13.2 Site specific

Sensitive sites include the drainage channel of the Greensidespruit and associated small wetland areas. These areas are important habitat for species of birds and animals. No rare or endangered species of birds and animals have been recorded previously in these wetlands. The species diversity of the Greensidespruit wetland shows the effect of past mining impacts of mining activities in the area.

3.14 Visual Aspects

3.14.1 General

The proposed new discard facility will lie adjacent to the N12 which is a major route for tourists and holiday makers travelling between Johannesburg and the eastern Mpumalanga. Other coal mines in the vicinity surround Greenside colliery and therefore, the background visual effects is dominated by mining activities.

3.14.2 Site Specific

The proposed new discard facility may lead to the mining activities becoming more visually prominent. Therefore, notwithstanding the existing mining character of the area, measures will be taken to screen the new discard facility from both the N12 and Kleinkopje – Clewer Road.

3.15 Sites of Archaeological and cultural importance

No sites of archaeological and cultural importance have been identified on or in the vicinity of the proposed site.

3.16 Regional Socio-economic aspects

3.16.1 General

The socio-economic environment of the study area within which the Greenside Colliery is situated, was discussed in the Integrated Development Plan (IDP), titled "*Integrated Development Plan*", dated March 2008, specifically developed for the eMalahleni Local Municipality. The relevant information from the above-mentioned report is included in this part of this document.

The Greenside Colliery falls under the jurisdiction of eMalahleni Local Municipality, which is situated in Mpumalanga. The eMalahleni Local Municipality represents one of six local municipalities in the Nkangala District, which in return is situated within the Middelburg Magisterial District. The eMalahleni Local Municipality occupies a total area of 2677.6710 km².

The Mpumalanga Province, with its capital Mbombela, occupies 6.5 % of the area of South Africa. Approximately 3.1 million people or 6.9 % of the population of South Africa are resident in this province.

3.16.2 Site specific

3.16.2.1 Population density, growth and location

According to the IDP, dated March 2008, the total population of the eMalahleni Local Municipality amounts to 276 412 persons (Census, 2001), which constitutes 27 % of the total Nkangala District Municipality's population (1 020 589 persons) and 9 % of the population of the Mpumalanga Province (3 122 988 persons).

The population density for the eMalahleni Local Municipality is 103.2 persons per km². When comparing the above Census (2001) data to the Census (1996) data, which reflected a population of 236 665 persons in the municipal area, a population growth of 3.15 % growth per annum (39 747 persons) occurred during this period.

Emalahleni acts as the service centre for the region and has had a steadily increasing population since the 1920's.

3.16.2.2 Major economic activities and sources of employment

According to the IDP, dated March 2008, the major economic activities and sources of employment in the Mpumalanga Province are the mining and quarrying sector (23.9 %), service sector (23.7 %), manufacturing sector (14.3 %) and the agricultural sector (13.9 %).

According to the IDP, dated March 2008, the primary business centre in eMalahleni is the eMalahleni Central Business District (CBD), which includes offices, retail, general business and commercial uses. Decentralised nodes are also present in the eMalahleni area with mainly retail uses. Nine major industrial areas occur within the eMalahleni Local Municipality area, mostly concentrated in and around eMalahleni Town. This also represents the largest concentration of industrial activity in the Nkangala District.

In addition to the industrial areas, mining occurs throughout the central and southern portions of the eMalahleni Local Municipality area, with large sections of the municipal area affected by shallow undermining and / or mineral rights. Approximately 82 % of the country's primary energy requirements are provided with by coal mining. Coal therefore forms the corner stone of the South African energy industry. Furthermore, the value of domestic coal sales amounts to an estimated 50 % of all mineral sales. Coal exports are the biggest earner of foreign exchange next to gold and platinum.

3.16.2.3 Unemployment estimate for the area

The main source of employment in the Emalahleni Local Municipality is the agricultural sector as well as the mining sector. According to the IDP, dated March 2008, approximately 45 % of the population within the municipal area is economically active. According to the 2001 statistics, 20 594 males are unemployed and 27 109 females. Compared to the 43 310 females, 25 204 males are not economically active in the municipal area. The economically inactive would include those underage and the pensioners.

The highest number of unemployed people reside in Hlalanikahle (23.5 %), followed by Lynnville (22.6 %), Phola (22.1 %), and Kwa-Guqa (20.9 %).

In addition to the above-mentioned areas, the Department of Social Development registered 15 000 people in the eMalahleni / Middelburg area as unemployed during 1994. Approximately 1 300 of these unemployed people reside within the eMalahleni Municipal District.

3.16.2.4 Housing demand and availability

One of the most prominent challenges facing the eMalahleni Local Municipality is the housing backlog in the area. According to the IDP, dated March 2003, the eMalahleni Local Municipality has the highest number of informal settlements in the Nkangala District, with an estimated housing backlog of approximately 40 000 units. The largest housing backlogs occur in the western and north-western parts of the eMalahleni Town. **Table 26** indicates the housing backlog in the eMalahleni Local Municipality for August 2004.

Table 26: Housing backlog in the eMalahleni Local Municipality (August 2004)

Housing type	Number of families
Informal Settlements	24 084
Backyard Dwellings	9 180
Multiple Family Accommodation	4 500
Hostel Conversions	700
Families on farms	874
Total	**39 338**

The rapid urbanisation in eMalahleni due to the high influx of people from rural areas moving to eMalahleni, contribute to the housing backlog.

Two new upmarket residential developments have been initiated namely the Bankenfeld Security Estate and the Buckingham Estate. Other upmarket residential developments are being expanded such as Wild Side. Various residential projects aimed at the low-income bracket are underway e.g. in Tasbet Park X 6 (3 000 units). A Reconstruction and Development Programme (RDP) for 1 500 houses is taking place between Pine Ridge and Klarinet on the Verena Road. The eMalahleni Municipality is furthermore busy with an upgrading and housing programme in the Emsagweni squatter camp with the development of 780 stands. Approximately 32 000 families require housing in the eMalahleni municipal area.

3.16.2.5 Social infrastructure

The social infrastructure in the eMalahleni Local Municipality is well developed and can be summarised as consisting of the following (during 2002):

- Tertiary institutions (e.g. universities and colleges), including the satellite campuses of the University of Pretoria and Pretoria Technikon,
- 23 High schools,
- 36 Primary schools,
- Hospitals,
- 18 Clinics,
- Police stations,

- 1 Emergency service,
- Post offices,
- 8 Libraries,
- ± 9 existing shopping centres,
- Various hotels, and
- ± 36 mines (mainly sand and clay quarries, as well as coal mines) are operated in a 45 km radius from eMalahleni.

3.16.2.6 Water supply

Approximately 92 % of the population in Emalahleni has access to piped water, and about 41 % of households have piped water inside their house or yard. The municipality provides potable water to the formal residential areas, townships and light industrial area, as well as water tanks in the informal settlements.

3.16.2.7 Sanitation

Emalahleni and immediate surroundings are on the municipal sewage, waste disposal and water supply network, with the informal settlements and townships, in the area, having limited access to these services.

3.16.2.8 Power supply

The municipality provides most of the electricity in the formal townships and residential areas, while Eskom provides electricity to the rural areas. **Table 27** below indicates the use of energy by households within the Emalahleni municipal area.

Table 27: Energy use within the eMalahleni municipal area

Energy use	Number
Electricity	57 815
Gas	163
Paraffin	2 232
Candles	21 740
Solar	134
Other	208

4. PUBLIC PARTICIPATION PROCESS

Section 24 of the Constitution of the Republic of South Africa of 1996 guarantees everyone the right to an environment that is not harmful to their health and well-being and to have the environment protected for the benefit of present and future generations. In order to give effect to this right, the NEMA, 2008 came into effect in May, 2009.

In terms of Section 24 (4) of the NEMA, 2008, procedures for the investigation, assessment and communication of the potential consequences or impacts of activities on the environment must, *inter alia*, ensure, with respect to every application:

- Coordination and cooperation between organs of state in the consideration of assessments where an activity falls under the jurisdiction of more than one organ of state.
- That the findings and recommendations flowing from an investigation, the general objective of integrated management laid down in NEMA, 2008 and the principles of environmental management set out in Section 2 of NEMA, 2008 are taken into account in any decision made by the organ state in relation to any proposed policy, programme, process, plan or projects, consequences or impacts.
- Public information and participation procedures which provide all integrated and affected parties, including all organs of state in all spheres of government that may have jurisdiction over any aspect of the activity, with a reasonable opportunity to participate in those information and participation procedures.

One of the general objectives of integrated environmental management laid down in Section 23(2) (d) of NEMA, 2008 is to: “ensure adequate and appropriate opportunity for public participation in decisions that may affect the environment.”

The National Environmental Management Principles as stipulated in NEMA, 2008 say;

- “Environmental management must place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural and social interests equitably.
- The participation of all interested and affected parties in environmental governance must be promoted, and all people must have an opportunity to develop the understanding, skills and capacity necessary to achieve equitable and effective participation, and participation by vulnerable and disadvantage persons must be ensured”.

The EIA Regulations of 2010 require that public participation must be done after submission of an application for a Scoping and Environmental Impact Assessment Report (S&EIR).

The public participation process for this project has been conducted in terms of the procedures and provisions of the public participation process in terms of the NEMA, 2008 and Chapter 6 of the EIA Regulations of 2010, as well as other relevant legislation such as the PAJA, 2000 and the PAIA, 2000.

4.1 Method of Notification

4.1.1 Press advertising

The proposed project was advertised in English and Afrikaans in a local newspaper, Witbank News, on 23 November 2012. The Witbank News was found to be the most appropriate newspaper in terms of its accessibility and language to the I&APs. A copy of the advertisement and proof of the placement thereof is attached in **Appendix D1**.

4.1.2 On-site advertising

Notice was also given to Interested and Affected Parties (I&APs) by notice boards. Notice boards were placed at three different, noticeable and conspicuous places (the entrance gate to the mine and two other locations surrounding the Greenside Colliery) on 22 November 2012. A copy of the site notice and photographs of the site notices are attached in **Appendix D2**.

4.1.3 Background Information Document

The Background Information Document (BID) developed for the proposed project provides background information pertaining to the project and is intended to inform I&APs of the proposed project. The BID also includes a registration form which I&APs, stakeholders and organs of state are encouraged to complete in order to register as an I&AP for the proposed project.

The BID was made available to all landowners within and surrounding the mine boundary area of the proposed project, as well as to all organs of state that may have jurisdiction over any aspect of the activity on 22 November 2012. The BID will also be made available to any other person who becomes involved in the on-going Public Participation Process.

Copies of the BID and proof of distribution of the BID to the adjacent landowners and organs of state have been attached as **Appendix D3**.

4.2 List of I&APs and stakeholders identified

All landowners within and surrounding the mine boundary area of the proposed project are considered to be registered I&APs.

Table 28 below, indicates the list landowners and adjacent landowners identified and notified (by means of e-mail, telephone, fax and/or post) of the proposed project. Copies of the notifications to the I&APs have been included in **Appendix D4**.

Table 28: List of I&APs notified

Farm Name	Owners Details
Blaauwkrans 323 JS Portion 1	Transnet Ltd.
Weltevreden 324 JS Portion RE	Truter Boerdery Trust
Vlaklaagte 330 JS Portion 16, 17	Uitspan Uitbreidings
Vlaklaagte 330 JS Portion 7, 14	Rudolf Martinus Botha
Vlaklaagte 330 JS Portion 9	Madeleine Louw
Vlaklaagte 330 JS Portion 10	Morne Stander
Vlaklaagte 330 JS Portion 12	Stephanus Johannes Petrus Duvenhage
Vlaklaagte 330 JS Portion 13	Adistra 96 CC
Vlaklaagte 330 JS Portion 15	Marie Liebenberg
Blaauwkrans 323 JS Portion 4, 17	Transnet Ltd.
Weltevreden 324 JS Portion 3, 4	National Department of Land Affairs
Vlaklaagte 330 JS Portion 0, 1, 3, 4	Uitspan Uitbreidings Pty Ltd.
Vlaklaagte 330 JS Portion 2	Jacobus Theodorus du Preez
Vlaklaagte 330 JS Portion 5, 6	Republic of South Africa
Vlaklaagte 330 JS Portion 8	Barend Johannes Venter
Vlaklaagte 330 JS Portion 11	Ludwig Paul van Schalkwyk
Waterpan 8 IS Portion 0	Duiker Mining Pty Ltd.
Tweefontein 13 IS Portion	Duiker Mining Pty Ltd.
Other adjacent landowners and lessees	Andrew Serelane
	Kleinkopje Colliery
	Landau Colliery
	Johan Oelofse
	Mr. Engelbrecht
	Mr. Bezuidenhout
	Mr. Jan Lauschagne
	Mr. PH Venter
	Neels Smith
	Paula Duvenhage
	Pierre Liebenberg
	Stefanus Johannes van Jaarsveld
	Truter Boerdery Trust
	Blackhill Primary School
	Mr. Babu Jiyane
	Mr. Fanie van Jaarsveld
	Mr. RM Botha
	Mr. Tielman Roux
	Sophia van Schalkwyk

4.3 List of organs of state identified

All organs of state which may have jurisdiction in respect of the proposed project is considered to be registered I&APs.

Table 29 below indicates the list of organs of state notified of the proposed project. Copies of the notifications to the organs of state have been included in **Appendix D4**.

Table 29: List of organs of state notified

Company Name
Department of Water Affairs
Mpumalanga Department of Economic Development, Environment and Tourism.
Department of Public Works
Department of Agriculture
Department of Minerals Resources.
Green Trust
Wildlife Society.
Mpumalanga Tourism and Part Agency
Mpumalanga Working for Wetlands (SANBI)
eMalahleni Local Municipality
Mpumalanga Parks Board
Nkangala District Municipality
Olifants Catchment Environmental Protection Group
South African Heritage Resource Agency
Transnet
Spoornet
Witbank Framers Association
Witbank Tourism Board
South African National Roads Agency Limited

4.4 I&AP register

All organs of state and landowners within and surrounding the mine boundary area of the proposed project is considered registered I&APs.

Table 30 below indicates the list of all registered I&APs of the project.

Table 30: List of all registered I&APs

No.	Name	Interest
1.	Transnet Ltd.	I&AP
2.	Truter Boerdery Trust	I&AP
3.	Uitspan Uitbreidings	I&AP
4.	Rudolf Martinus Botha	I&AP
5.	Madeleine Louw	I&AP
6.	Morne Stander	I&AP
7.	Stephanus Johannes Petrus Duvenhage	I&AP
8.	Adistra 96 CC	I&AP

No.	Name	Interest
9.	Marie Liebenberg	I&AP
10.	National Department of Land Affairs	I&AP
11.	Jacobus Theodorus du Preez	I&AP
12.	Republic of South Africa	I&AP
13.	Barend Johannes Venter	I&AP
14.	Ludwig Paul van Schalkwyk	I&AP
15.	Duiker Mining Pty Ltd.	I&AP
16.	Andrew Serelane	I&AP
17.	Kleinkopje Colliery	I&AP
18.	Landau Colliery	I&AP
19.	Johan Oelofse	I&AP
20.	Mr. Engelbrecht	I&AP
21.	Mr. Bezuidenhout	I&AP
22.	Mr. Jan Lauschagne	I&AP
23.	Mr. PH Venter	I&AP
24.	Neels Smith	I&AP
25.	Paula Duvenhage	I&AP
26.	Pierre Liebenberg	I&AP
27.	Stefanus Johannes van Jaarsveld	I&AP
28.	Truter Boerdery Trust	I&AP
29.	Blackhill Primary School	I&AP
30.	Mr. Babu Jiyane	I&AP
31.	Mr. Fanie van Jaarsveld	I&AP
32.	Mr. RM Botha	I&AP
33.	Mr. Tielman Roux	I&AP
34.	Sophia van Schalkwyk	I&AP
35.	Department of Water Affairs	Organ of State
36.	Department of Economic Development, Environment and Tourism.	Organ of State
37.	Department of Public Works	Organ of State
38.	Department of Agriculture	Organ of State
39.	Department of Minerals Resources.	Organ of State
40.	Green Trust	Organ of State
41.	Wildlife Society.	Organ of State
42.	Mpumalanga Tourism and Part Agency	Organ of State
43.	Mpumalanga Working for Wetlands (SANBI)	Organ of State
44.	eMalahleni Local Municipality	Organ of State
45.	Mpumalanga Parks Board	Organ of State
46.	Nkangala District Municipality	Organ of State

No.	Name	Interest
47.	Olifants Catchment Environmental Protection Group	Organ of State
48.	South African Heritage Resource Agency	Organ of State
49.	Transnet	Organ of State
50.	Spoornet	Organ of State
51.	Witbank Framers Association	Organ of State
52.	Witbank Tourism Board	Organ of State
53.	South African National Roads Agency Limited	Organ of State

4.5 Comments and responses report

All issues, comments and questions received from the I&APs up to date have been summarised in **Table 31**. Where responses are already available as part of the scoping process, these have been included in the Scoping Report in the table below. In all other cases, responses will be provided as part of the final Scoping Report. Copies of the comments received have been included in **Appendix D5**.

Table 14: Issues received to date, and responses to these issues

Name	Company	Date	Contact Person	Method of comment	Issue raised	Response
Mr. Andrew Silabela	Enqome Yethu Primary Co-operative (Pty) Ltd	9th January 2013	Mr. Andrew Silabela	Fax	We as community of Mgewane are surrounded by Kleinkopje, Shared Services, Greenside, Highveld Hospital and Navigation Plant. We have been affected with coal dust, blasting, noise from conveyor belt, sinking holes and cracks.	Thank you for your letter. We have registered you as an interested and affected party.
Mr. Pierre Marias (e-mail was intended for Mr. Jan Labuschagne and Mr. Pierre Marias responded)	Private Landowner	22 November 2012	Mr. Pierre Marias	E-mail	Ms Fellowes, This email address does not belong to your intended recipient. Please delete from all records. "All construction will take place within the 100m buffer of the wetland"? For how many years will the coal mining industry and the government be allowed to rape our soil and scarce water sources before it is all gone?? - Make sure that Shangoni starts paying you in foreign currency, because your children will not inherit	Dear Pierre, Thank you for your response. I will update the database. For the sake of the database and to prevent future miss communications on which farm do you reside?

					the land they were born to.	
Amos Bantu Mkhonto	Papamo General Services cc	27 November 2012	Amos Bantu Mkhonto	Fax	We at Papamo Services cc wish to be included in the interested and affected parties register and to comment on this application.	Thank you for your letter. We have registered you as an interested and affected party.

4.6 Scoping Phase Public meeting

A public meeting was held on the 23rd of January 2013. Stakeholders were notified of this meeting via the newspaper advertisements, on-site notices and telephonically (refer to Part 4.1), as well as in the BID. The minutes of the public meeting, a copy of the presentation and the attendance register are attached as **Appendix D6**.

4.7 Access and opportunity to comment on all written submissions

This draft Scoping Report was be made available to the public for review for a period of sixty (60) days, from 18 November 2013 – 05 February 2014. Hard copies of the mentioned draft document have been made available at the Greenside Colliery for the I&APs to view and a copy of the draft document has been submitted to DMR and DWA for review. A register and comment sheet accompanies the hard copies at the public viewing station. An electronic copy of the draft Scoping Report was also posted on the Shangoni Management Service's website (www.shangoni.co.za) for public comment for the same period of sixty days.

All the registered I&APs were notified of the availability of the draft Scoping Report for public review by 18 November 2013. The I&APs were also informed to complete the register subsequent to reviewing the draft Scoping Report and also to submit any comments to Shangoni Management Services at the contact person below by no later than 05 February 2013.

EAP contact details: Ms Minnette Le Roux, Shangoni Management Services, P.O. Box 74726, Lynnwood Ridge, 0040, Cell: 083 660 0622 Tel: 012 807 7036 Fax 012 807 1014 , e-mail: minnette@shangoni.co.za.

4.8 CONSULTATION WITH THE RELEVANT AUTHORITIES

4.8.1 Application Form in Terms of the NEMA, 1998

The applicable Environmental Authorisation Application Form under NEMA, 1998 was submitted to the Mpumalanga Department of Economic Development, Environment and Tourism (MDEDET) on the 30th of October 2012. A reference number (17/2/3N-205) was issued by MDEDET on the 9th of November 2012. The letter of acknowledgement indicating the above mentioned reference number is attached as **Appendix B1**.

4.8.2 Scoping Phase Authorities meeting

Meetings were held on 29 November 2012 and 14 May 2013 at the Department of Water Affairs in Pretoria to inform the Department of Water Affairs of the proposed project and to gain their input into

the process to be followed for the compilation of the IWULA for the proposed project. The minutes of the meetings and attendance registers are attached hereto as **Appendix B2.**

An authorities meetings was also be held with the DMR on 07 May 2013 to gain input on the way forward with regards to the EMP Addendum under the MPRDA, 2002 and to gain input on the project. The minutes of the meeting and attendance register are attached hereto as **Appendix B3.**

4.8.3 Further consultation with relevant Authorities

Once the Scoping phase public comment period has been completed another meeting will be held with DWA to gain input on the IWULA. Once the EMP, IWULA and EIA for the proposed project has been finalised for submission another authorities meeting will be held with DMR and DWA respectively. The purpose of this authorities meeting will be to present the findings of the EIA process to the authorities to assist them in the decision making process.

5. DESCRIPTION OF ALTERNATIVES

As required in term of the requirements of Regulation 28 (j) (of Regulation 543) of the EIA Regulations, 2010, under the NEMA, 1998 the identified potential alternatives as well as the advantages and disadvantages that they may have on the environment and the community that may be affected have been discussed in this part of the Scoping Report. Also included here is the advantage and disadvantage the proposed project may have on the environment and the community that may be affected.

5.1 Alternatives considered during the Scoping phase

5.1.1 Alternatives in terms of road infrastructure

The following alternatives were identified with regard to the type of access routes to and from the new discard facility and associated infrastructure (refer to **Table 32**):

- Tar road.
- Gravel road.

Table 32: Alternative access to site

Option	Advantage	Disadvantage
Tar road	Sturdier and longer lasting	More costly to construct
	Less dust is created	
Gravel road	Cheaper to construct	Requires maintenance more regularly
		More dust is generated

Since tarred roads are expected to be more resilient, it is intended to construct tarred roads in order to gain access to the proposed site. This will also aid in minimising the cumulative impacts of dust within and around the site. However the haul roads to be used by the haul trucks will remain gravel road. These options will be further evaluated as part of the EIA Phase of the project.

5.1.2 Alternatives in terms of the location of the discard facility

Initially, four potential sites were identified for the placement of the proposed discards facility. These four sites are indicated in **Figure 4**. **Table 33** below indicates the alternative sites identified, as well as the advantages and disadvantages associated with each.

Table 33: Alternative Sites for the discard facility

Site	Vlaklaagte	RLT	Main Village	Groenfontein
Location	West of the plant	North east of the plant	South west of the plant	South of the plant

Advantages	The largest volume of discard can be placed here, as there is a large space available.	Close to existing plant. Surface rights belong to AOL	Close to existing plant. Surface rights belong to AOL	Close to existing plant. Surface rights belong to AOL
Disadvantages	Furthest from existing plant. Some Surface and Mineral rights do not belong to AOL.	The discard facility will have to consist of two separate dumps. Discard conveyance will cross Nauuwpoortspruit and public road. Insufficient volume of space available for LOM. Restricted height of dump as 2 and 4 seams are mined out.	Insufficient volume for LOM. Will require village to be demolished and redeployment of mine personnel. Restricted height as 2 and 4 seam mined out.	Insufficient volume for worst case LOM scenario. Will require Kleinkopje to change their rehabilitation strategy for the 3A North Pit. Mine plan needs to accommodate 4 seam pillar safety.

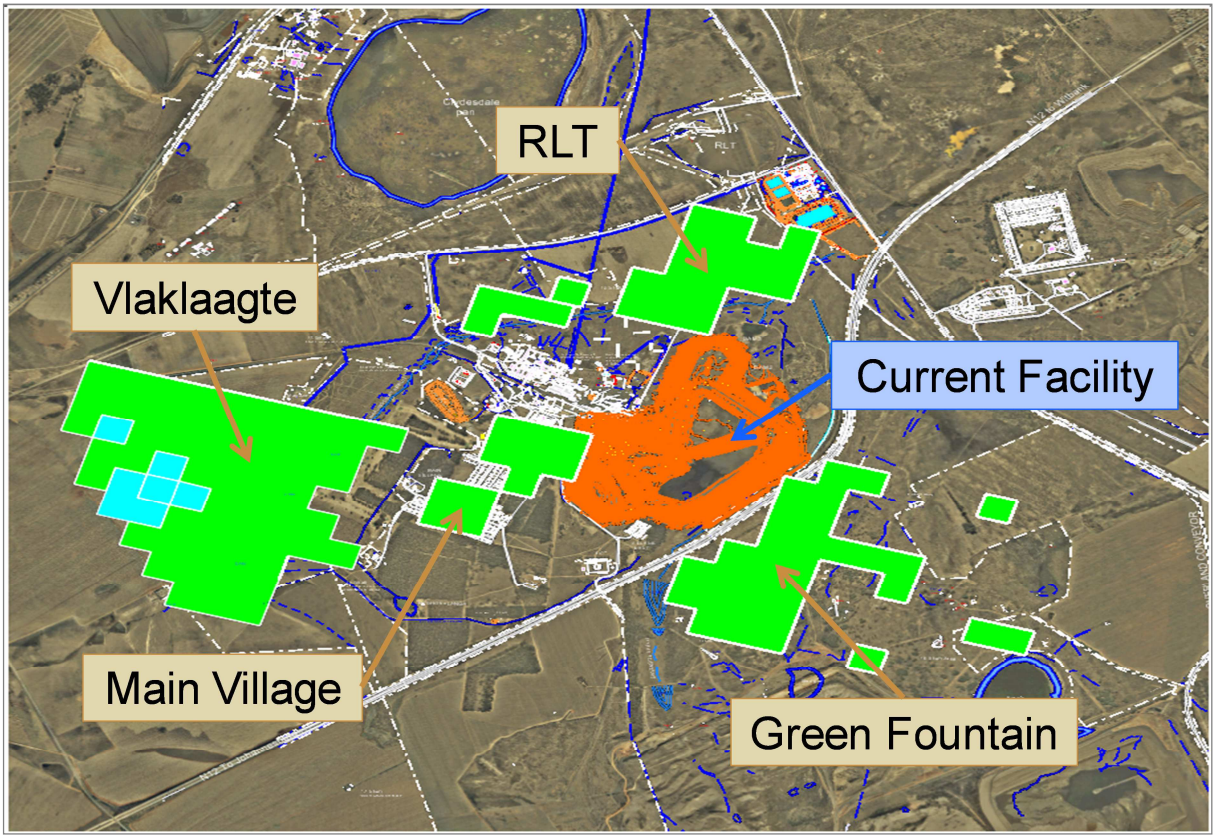

Figure 5: Proposed Alternative Sites

Currently the preferred option based on the findings of the above mentioned comparisons is option 4: Groenfontein. This option has therefore been described in Part 3 of this document for approval.

5.1.3 Land use or development alternatives

The following land use alternatives have been identified and were investigated as part of the Scoping process, and are briefly compared in **Table 34** below:

- Utilisation of the surface area for the new discard facility.
- Utilise the surface area for grazing of livestock.
- Utilise the surface area for crop production.
- None of the above (No-go option) (refer also to Part 5.2).

Table 34: Assessment of land use alternatives

Environmental component	Discard Facility	Grazing	Crop production	No-go
Geology	No impact.	No impact.	No impact.	Some geological strata may be permanently altered by future underground mining activities to be done by Greenside Colliery.
Topography	Topography will be permanently altered by the new discard Facility.	No impact.	Topography will be levelled.	Topography has already been altered by previous mining and burrow pits.
Soil	Soil structure and functioning will be permanently altered.	Soils will be eroded.	Soils will be chemically and physically modified.	Soils have already been altered by previous mining and minor erosion exists in cultivated areas.
Land use	Land use will change from derelict land to mining and related activities.	Land use will be altered to agriculture.	Land use will be altered to agriculture.	Land use remains derelict.
Land capability	Land capability will be permanently altered.	Land capability may be lowered if overgrazing occurs.	Land capability may be impacted on if poor farming techniques are employed.	Land capability has already been impacted on by previous mining and related activities.
Flora	Natural vegetation will be destroyed in the land use area.	Natural vegetation will be impacted on if overgrazing occurs.	Natural vegetation will be destroyed in all crop areas.	Natural vegetation has already been disturbed by mining and related activities and alien

Environmental component	Discard Facility	Grazing	Crop production	No-go
				infestation.
Fauna	Fauna will be impacted on as habitats are destroyed.	No impact.	Fauna will be impacted on as habitats are destroyed.	Fauna has already been impacted on as habitats have been destroyed by past mining activities.
Surface water	Surface water quantity and quality may be compromised.	No impact.	Surface and groundwater may be used for irrigation.	Surface water has already been polluted by previous mining, and will continue to be polluted until such time as mining areas are rehabilitated.
Groundwater	Groundwater quantity and quality may be compromised.	No impact.	Groundwater may be used for irrigation.	Groundwater has already been polluted by previous underground and opencast mining activities, and will continue to be polluted until such time as the mining areas Closed and rehabilitated.
Air quality	Dust will be generated.	Dust will be generated if overgrazing occurs.	Dust will be generated after the harvest season.	Dust from the surrounding mining activities will continue to be generated.
Noise	Noise will be slightly increased.	No impact.	Noise will be generated during planting and harvesting seasons.	Noise will continue to be generated by the surrounding mining and related activities, as well as the N12.
Visual	The visual environment will be altered by changes in topography.	No impact.	The planting of crops will alter the visual environment.	No impact.
Sensitive landscapes	Sensitive landscapes will be altered.	Sensitive landscapes will be altered or destroyed if overgrazing occurs.	Sensitive landscapes will be altered or destroyed.	No further impact.
Sites of	No impact.	No impact.	No impact.	No further impact.

Environmental component	Discard Facility	Grazing	Crop production	No-go
archaeological and cultural interest				
Socio-economic	Loss of jobs will be avoided.	No impact.	Some jobs may be created.	No further impact.
Interested and affected parties	Surrounding landowners may be further impacted upon as a result of impacts listed above.	No impact.	No impact.	No further impact.
Cumulative impacts	Large mining complexes already exist in the vicinity of the Greenside Colliery. Impacts of mining (as described above) may be slightly increased.	Destruction of the natural environment will be compounded if overgrazing takes place.	Destruction of the natural environment will be compounded if over- fertilisation occurs or poor farming techniques are employed.	Large mining complexes already exist in the vicinity of the Greenside Colliery. Impacts of mining (as described above) will be compounded.

Major impacts associated with each land use alternative have been summarised for comparative purposes. Each proposed land use alternative will impact on the natural environment at the proposed site.

5.2 Consequences of not proceeding with the proposed project (no project alternative)

The 'No Project' alternative has been investigated in terms of the above-mentioned alternatives.

The 'No Project' alternative is not yet considered due to the anticipated benefits of the proposed new discard facility. Expected indirect benefits of the proposed project include:

- Continued employment of staff.
- Potential for the creation of additional jobs.
- Continued upliftment of the surrounding communities.
- Rehabilitation of environmental issues within the wetland areas.
- Continued supply of coal to the local, national, and international markets, and therefore contribution to local, provincial and national economy.

The following specialist studies will be conducted and have been initiated as part of the proposed new discard facility:

- Geohydrological study.
- Ecology (fauna and flora).
- Wetland study.

Should the 'No Project' option be implemented, jobs of workers that are currently employed at the Greenside Colliery may be compromised. In addition, the Greenside Colliery will not be able to continue to supply coal to the existing markets at the current rate of demand. Positive impacts of the proposed project would also be lost if the no-project option is carried out.

While the 'No Project' option is not yet considered to be the preferred alternative, it will not be discarded. The 'No Project' option will be further assessed as part of the EIA process for the proposed project.

6. IDENTIFICATION OF ANTICIPATED ENVIRONMENTAL IMPACTS

This part of the Scoping Report document focuses on the identification of the major potential impacts the activities, processes and actions may have on the surrounding environment. Furthermore it indicates the major impacts the aspects of these activities have on the environmental components associated with the site, as required in terms of Regulation 28 (g) (of Regulation 543) of the EIA Regulations, 2010, under the NEMA, 1998.

6.1 Impact assessment methodology

For the purpose of the Scoping report it is required by Regulation 28 (g) (of Regulation 543) of the EIA Regulations, 2010, under the NEMA ,1998 that the major potential impacts the activities, processes and actions may have on the surrounding environment, is identified.

Regulation 31 (of Regulation 543) of the EIA Regulations, 2010, under the NEMA, 1998, requires that an EIR includes an assessment of the status, extent, duration, probability, reversibility, replaceability of resources and mitigatory potential of the major potential environmental impacts of the proposed mining operation be undertaken.

The identification of the major potential impacts has therefore only been included as part of the requirements for the compilation of the Scoping Report. The prediction of the nature of each impact, the evaluation of each impact by rating its significance and the management and mitigation measures adopted to address each impact, will be assessed during the EIR using the criteria presented below.

Different impacts are associated with the construction and operational phases of the proposed activity. The significance will be determined by both the extent and duration of the impact. The environmental risk of any aspect is determined by a combination of parameters associated with the impact. Each parameter connects the physical characteristics of an impact to a quantifiable value to rate the environmental risk. A description of the parameters used in this impact assessment is listed in the **Table 35** below.

Table 155: Environmental impact assessment parameters

Parameters	Description
Extent	Refers to the physical or geographical size that is affected by the impact. It can be categorised into the following ranges: • Onsite – Within specific site boundary (weight value – 1) • Local – Within municipal boundary (weight value – 2) • Regional – Outside municipal boundary (weight value – 3)
Duration	Time span associated with impact: • Short term – 1 Year or less (weight value – 1) • Medium term – 1-5 Years (weight value –2) • Long term – Longer than 5 Years (weight value – 3)
Intensity and reversibility	The severity of an impact on the receiving environment: • Low – Natural and/or cultural processes continue in a modified way and is reversible (weight value – 1) • Medium – Natural and/or cultural processes stop and is partially reversible (weight value – 2) • High – Natural and/or cultural processes disturbed to an irreversible state (weight value – 3)
Significance of Impact / Consequence	Adding the extent, duration and intensity together provides the significance of the impact (High, Medium or Low). **Extent + Duration + Intensity = High/Medium/Low Impact**
Probability	The likelihood of an impact occurring: • Unlikely – 0% - 45% chance of the potential impact occurring (weight value – 1) • Possible – 46% - 75% chance of the potential impact occurring (weight value – 2) • Likely - >75% chance of the potential impact occurring (weight value – 3)
Environmental Risk Refer to Table 15 below	Multiplication of the significance of the impact by the probability of the impact occurring produces a final conclusion of the overall risk that an impact poses to the surrounding environment. **High/Medium/Low Impact X Probability = High/Medium/Low Environmental Risk**

Significance of Impact				
		Low Impact (3 → 5)	Medium Impact (6 → 8)	High Impact (9)
Probability	Definite / Very Likely 3	9 - 15 L - M	18 - 24 M - H	27 H
	Possible 2	6 - 10 L - M	12 – 16 M	18 M - H
	Unlikely 1	3 - 5 L	6 – 8 L	9 L

ENVIRONMENTAL RISK	Guidelines for Control Strategies
(H) - High	Proactively reduce risk level, short term response.
(M- H) Medium to High	Proactively reduce risk level, short term response.
(M) – Medium	Management strategies to reduce risk level, short to medium term response.
(L – M) Low to Medium	Management strategies to reduce risk level, short to medium term response, operational control and housekeeping.
(L) - Low	Operational control and housekeeping.

6.2 Project Phases and Activities to be undertaken

For the purposes of this impact assessment, the project timeframe will be subdivided into the following four phases:

- Construction Phase.
- Operational Phase.
- Decommissioning Phase.
- Post Closure Phase.

Potential cumulative impacts were also identified and assessed for each component, where applicable.

6.2.1 Construction Phase

The following activities (including actions and processes) are anticipated to be undertaken during the Construction Phase of the project:

The Construction Phase marks the beginning of physical changes to the site. During this phase, the following activities will take place:

- Surveying and pegging out of the construction areas for the dam wall upgrade, haul routes, discard silo, dirty and clean water systems, power lines, potable water pipelines, sewage pipelines, pollution control dam, conveyor routes, Office and Workshop Complex and new discard facility.
- Establishing and, upon completion, rehabilitation of construction sites/camps at the proposed construction areas with lay-down yards, machinery, vehicle parking areas, service areas, water supply, portable toilets and temporary waste storage.
- Utilisation of existing access roads to the proposed conveyor routes, office complex, discard silo and discard facility sites.
- Transporting materials and personnel to the proposed sites.
- Preparation of construction servitudes along the conveyor routes.
- Clearing of vegetation for the upgrading of the dam wall and construction of haul routes, discard silo, dirty and clean water systems, pollution control dam, conveyor routes, Office and Workshop Complex and new discard facility.
- Temporary stockpiling of soil, spoil and imported materials along the proposed conveyor routes and at the various construction sites.
- Possible blasting of hard rock areas along conveyor route.
- Pipe jacking or trenching through, roads and watercourses.
- Dewatering trenches, as required.
- Preparing and laying of material for construction.
- Construction of the proposed infrastructure associated with proposed discard facility, including amongst other:
  - An Overland Conveyor System from the plant to the new discard dump
  - Discard Silo.
  - Haul roads.
  - Dirty and Clean Water Separation Systems.
  - The Workshop Complex.
  - The Office Complex, including Water and Sewage system for the workshop and offices.
  - Diesel storage tanks.
  - Power Lines.
  - Pollution Control Dam.
- Upgrading of the road over the dam wall and modifications to the bridge crossing the N12 to accommodate the conveyor system.
- It is anticipated that the construction phase will take approximately 18 months to complete.

The following anticipated impacts have been identified to be undertaken during the Construction Phase of the project:

Table 36: Major anticipated impacts identifies during the construction phase

Construction Phase		
1.	**Geology**	It is not anticipated that the construction of the discard facility or the associated infrastructure will have any impact on the geology
2.	**Topography**	The temporary stockpiling of topsoil and imported material will impact on the topography of the area.
3.	**Soil**	The stripping of topsoil and excavation of soil will impact on the soil and soil characteristics (e.g. fertility).
4.	**Land capability**	The land capability of the areas associated with the discard facility and associated infrastructure will be permanently altered.
5.	**Land use**	The land use of the area will be impacted on as it was derelict land and will now change to mining related.
6.	**Vegetation**	The vegetation on the areas associated with the discard facility and associated infrastructure will be impacted on by the stripping and clearing of vegetation.
7.	**Animal life**	The animal life in the area has already been impacted upon by mining activities in the area; however the removal of vegetation will decrease the size of the habitat available for animal life.
8.	**Surface water**	The construction of the discard facility, associated infrastructure and the removal of vegetation may cause an increase in the amount of suspended solids in the surface water runoff.
9.		Ponding of water on the surface may occur during the construction phase.
10.		Contamination of the clean water system may occur.
11.	**Groundwater**	Oil leaks from construction vehicles and contaminated material may enter the groundwater trough seepage.

12.	**Air Quality**	During the construction phase of the project, dust will be generated due to the stripping and removal of vegetation.
13.	**Noise**	Noise levels are expected to increase during the construction phase due to the stripping and removal of vegetation, trucks conveying material and the construction of infrastructure.
14.	**Sensitive landscapes**	Some of the infrastructure will be constructed within the 500 meter buffer zone of the wetland areas. The wetland areas could therefore be impacted upon, and indirectly affect the natural water resources on the site.
15.	**Visual**	The construction of the discard facility and associated infrastructure, moving of vehicles at night and the removal of vegetation will increase the visual impact in the area.
16.	**Socio-Economic**	The discard facility will benefit the local economy in a sense that the facility will ensure job security as well create possible job opportunities.

6.2.2 Operational Phase

The following activities (actions and processes) are expected to occur during the Operational Phase of the proposed project:

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During the Operational Phase, the new discard facility will be commissioned and the depositing of mine discard will commence. The associated infrastructure will also be utilised in support of the functioning of the discard facility.

The following activities will take place during the Operational Phase:

- Utilisation and maintenance of the facilities at the Office Complex and Workshop Complex.
- Conveyance of discard material from the plant to the discard silo via the conveyor system.
- Hauling of coal discard from the discard silo to the discard facility via trucks.
- Dust suppression of haul roads.
- Storage of potable water at the Office Complex.
- Utilisation and maintenance of the dirty and clean water systems, including the pollution control dam.
- Repairing and replacing infrastructure;
- Lighting/illumination at the different infrastructure areas.
- Progressive development of the Discard Facility.
- Utilisation and maintenance of the power supply and various pipelines.
- Utilisation and maintenance of the access and haul roads.

The Operational Phase of the proposed project has been allocated a life cycle of 20 years.

The following anticipated impacts have been identified to be undertaken during the Construction Phase of the project:

Table 37: Anticipated impacts identified during the operational phase

Operational Phase		
1	**Geology**	It is not anticipated that the operation of the discard facility or the associated infrastructure will have any impact on the geology.
2	**Topography**	The topography will be negatively impacted upon due to the progressive development of the discard dump.
3	**Soil**	The soil will become sterile due to the deposition of mine residue on the surface.
4	**Land capability**	The land capability of the site will continue to be permanently altered.
5	**Land use**	The land use of the area will now change to mining related.
6	**Vegetation**	The vegetation will be suppressed in the area of the discard facility due to the activities conducted on and around the facility.
7	**Animal life**	Animal life in the area has been and still is affected by previous and current mining activities of the Greenside Colliery and surrounding mines.
8	**Surface water**	The clean water system may be contaminated through the runoff of surface water from dirty areas.
9		An increase of suspended sediment in surface water runoff may occur.
10	**Groundwater**	Groundwater contamination may occur due to the seepage of the discard facility.
11	**Air Quality**	Vehicle emissions and dust will be generated in the utilisation of the disposal facility.

12	**Noise**	The impacts of noise will be compounded and an increase of noise will occur towards the south of the Greenside mining area, as there will be an increase of activity at the new disposal facility.
13	**Sites of cultural and archaeological interest**	No sites of archaeological and cultural importance have been identified on or in the vicinity of the proposed site and will therefore not be impacted on.
14	**Sensitive landscapes**	Some of the infrastructure will be located within the 500 meter buffer zone of the wetland areas. This could therefore be impacted upon, and indirectly affect the natural water resources on the site.
15	**Visual**	The discard facility and associated infrastructure, moving of vehicles at night and the removal of vegetation will increase the visual impact in the area, especially from the N12.
16	**Socio-Economic**	The discard facility will benefit the local economy in a sense that the facility will ensure job security as well create possible job opportunities.
17	**I&APs**	The discard facility will benefit the local economy in a sense that the facility will ensure job security as well create possible job opportunities.
18		The discard facility and associated infrastructure, moving of vehicles at night and the removal of vegetation will increase the visual impact in the area.
19		The impacts of noise will be compounded and an increase of noise will occur towards the south of the Greenside mining area, as there will be an increase of activity at the new disposal facility.
20		Vehicle emissions and dust will be generated in the utilisation of the disposal

		facility.

6.2.3 Decommissioning Phase

The following activities (actions and processes) are expected to take place during the Decommissioning Phase of the proposed project:

- Rehabilitation and restoration of all the disturbed areas.

In the unlikely event that the project is decommissioned, plans will be drawn up for dismantling the infrastructure and rehabilitating the sites.

The following anticipated impacts have been identified to be undertaken during the Construction Phase of the project:

Table 38: Anticipated impacts identified during the decommissioning phase

Decommissioning Phase		
1.	**Geology**	It is not anticipated that the discard facility or the associated infrastructure will have any impact on the geology
2.	**Topography**	Depending on the agreed upon end land use for the area, the disposal facility may be re-processed, levelled and rehabilitated in the future.
3.	**Soil**	Soils may be compacted by the use of vehicles and machinery for the rehabilitation of disturbed areas.
4.		Once natural vegetation has become established in rehabilitated soils, the soils will be able to begin to return to their pre-mining status.
5.		There will be an increase in soil erosion by water and wind as soils will be exposed. Soils will be exposed from the time that they are placed on rehabilitated areas until such time as vegetation has been established.
6.		Soil in other areas may be impacted if the quantity of soil at the Greenside Colliery is insufficient for rehabilitation activities. In such a case, soil will need to be imported to the mine boundary area for rehabilitation.
7.		Compacted soils on the Co-disposal facility will be ripped and seeded, improving the soil structure and functioning.

8.	**Land capability**	As a result of the rehabilitation activities, the land capability in some surface land use areas will be altered. Land capability will be altered by the placing of soils and establishment of vegetation for grazing. The final land capability will depend on the agreed end land use.
9.	**Land use**	As a result of the rehabilitation activities, the land use in some surface land use areas will be altered. Rehabilitation activities will be undertaken to allow for the agreed upon end land use for the area.
10.		In some of the areas the land use will return to Pre-mining conditions.
11.		The land use of the disturbed areas will be returned to agricultural land use (mostly grazing), even though the production potential will be decreased due to loss of land capability.
12.	**Vegetation**	Premature grazing of livestock on rehabilitated areas may affect the re-establishment of vegetation on disturbed areas.
13.		Re-establishment of vegetation on rehabilitated infrastructure areas.
14.		
15.		
16.	**Animal life**	The re-establishment of vegetation after the removal of redundant surface water management infrastructure will allow for animal life to return to the rehabilitated sites.
17.		Initially the rehabilitation activities may frighten or result in injury of animal life if not prevented / mitigated. However, the resettlement of animal life in the rehabilitated areas is anticipated due to the re-establishment of suitable habitats when rehabilitation is completed.
18.	**Surface water**	The rehabilitation activities associated with the decommissioning of discard facility may temporary result in the blocking of surface water runoff resulting in ponding and reduction of surface water run off quantity, if not prevented.
19.		Initially, the ripped up and rehabilitated surface water management areas will be exposed and erosion may take place. This could lead to an increase in suspended particles in surface water runoff, if not mitigated.
20.		The discard facility poses a significant liability with the risk of future impacts on water quality.

21.	**Groundwater**	Generation of acid mine drainage and spontaneous combustion may occur due to the exposure of carbonaceous material to oxygen.
22.	**Air Quality**	The ripping of compacted areas during rehabilitation will increase the amount of dust generated.
23.	**Noise**	Noise levels are expected to decrease during the decommissioning phase due to decrease in vehicles movement.
24.	**Sensitive landscapes**	Acid mine drainage will impact negatively on sensitive landscapes to the east and west of the disposal facility.
25.		Erosion on and around the Co-disposal facility will result in increased sedimentation.
26.		The rehabilitation of the wetland areas will have a positive impact on the wetlands.
27.	**Visual**	The re-establishment of vegetation on the rehabilitated infrastructure areas, and the removal of haul roads as well as stockpile areas as part of the rehabilitation of infrastructure will allow the sense of place to return to an agricultural sense.
28.		The removal of redundant infrastructure and the re-establishment of vegetation on the rehabilitated areas will allow the sense of place to return to an agricultural sense.
29.		The visual landscape will be impacted by the rehabilitation of the disturbed land use surfaces. The visual landscape in such areas will return to close to its pre-mining state.
30.	**Socio-Economic**	Jobs will be lost, commencing during the Decommissioning Phase as the mining and related activities will have ceased.
31.		Since jobs will be lost, the families and communities previously supported by the workers at the mine will be detrimentally affected.
32.		The supply of coal from Greenside Colliery to local and national markets will cease, this may impact on the energy production in the region.

33.	I&AP's	Rehabilitation activities will result in the removal of most of the mining and related infrastructure. This will result in an alteration in the landscape visually. I&APs will be impacted by changes, as the sense of the place will be altered.
34.		Some impacts previously impacting on I&APs throughout the LOM will decrease and/or cease completely. This includes impacts on ait quality by the generation of dust and noise impacts.
35.		Surface water quality will be improved by rehabilitation activities. This will decrease the impact on surface water of downstream users.
36.		Groundwater may be impacted on if a pollution plume develops during the Decommissioning Phase. This will impact the groundwater quality of downstream groundwater users.

6.2.4 Post Closure Phase

The Post-closure Phase will commence once the mine has obtained a Closure Certificate from the DMR.

The following anticipated impacts have been identified to be undertaken during the Construction Phase of the project:

Table 39: Anticipated impacts identified during the Post Closure phase

Post Closure Impacts		
1	**Geology**	No additional impacts are anticipated on the geology of the mine boundary area.
2	**Topography**	No additional impacts are anticipated on the topography of the mine boundary area.
3	**Soil**	No additional impacts are anticipated on the soils of the rehabilitated sites. The rehabilitation of the soils on the site should be conducted in such a manner that the highest possible agricultural potential is attained post closure.
4	**Land capability**	No additional impacts are anticipated on the land capability of the rehabilitated sites.

5	**Land use**	No additional impacts are anticipated on the land use of the rehabilitated sites. Agricultural land use is anticipated to continue post Closure.
6	**Vegetation**	No additional impacts are anticipated on the vegetation of the rehabilitated sites.
7	**Animal life**	No additional impacts area anticipated on the animal life of the study area. Species previously present on site will in all probability return if suitable habitat is re-established .
8	**Surface water**	Acid mine drainage could lead to water of poor quality (high acidity, high levels of metals, especially iron and aluminium, etc.) entering the surface water (either directly through overflowing, decanting or seepage into groundwater that reaches surface water ecosystems. This will have a negative impact on especially biota intolerant to water quality alterations, but depending on the severity may be detrimental to the entire aquatic ecosystem.
16	**Groundwater**	Contaminated pollution plume may develop and move.
17	**Air quality**	No additional impacts are anticipated on the air quality of the area.
18	**Noise**	No additional impacts are anticipated on the ambient noise levels of the area.
19	**Sensitive landscapes**	No additional impacts are anticipated on the sensitive landscapes (wetlands) associated with the project. The permanent impacts associated with the Construction and Operational Phase will remain applicable.
20	**Visual**	No additional impacts are anticipated on the visual aspects associated with the project.
21	**Socio-Economic**	No additional impacts are anticipated on the socio-economic aspects associated with the project.
22	**I&APs**	The long term surface water and groundwater impacts described above will also affect the I&APs.

6.2.5 Cumulative Impacts

The following anticipated impacts have been identified to be undertaken during the Construction Phase of the project:

Table 40: Anticipated cumulative impacts

Cumulative Impacts			
1	**Geology**	The Witbank Coal Field, located mostly within the Mpumalanga Highveld region between Bethal and Springs in Gauteng, generally contains five seams of coal most of which is good quality and high calorific value. As such, coal is extracted from numerous mines located near eMalahleni, in the eMalahleni Local Council's area of jurisdiction. Due to the existing surrounding coal mining operations (Xstrata South Africa (Pty) Ltd., Anglo Operations Ltd., etc.) in the surrounding area, the geological strata in the region will be permanently altered.	The contribution of the mine to this cumulative impact will increase progressively as mining advances.
2	**Geology and Socio-economic conditions**	The extraction of coal from the Witbank Coal Field has occurred over a period spanning more than a century, and modern day opencast mining techniques enable coal extraction to be maximised. This has led to the systematic depletion of the coal reserves in the region, increasing significantly in the last several decades due to improvements in mining technology. Since coal is a fossil fuel it is a non-renewable resource, and as the remaining coal reserves decrease, the value of the coal will increase because of supply and demand principles. This will lead to an increase in income generation and positive contributions to the regional socio-economic conditions during the Operational Phase of the mine, but will ultimately result in the complete exhaustion of the coal reserves, leaving no coal for future generations.	Coal reserves currently being mined at the Greenside Colliery will be exhausted by 2035.

3	**Topography, Land use and Visual aspects**	The Greenside Colliery is located in a region where opencast coal mining is common place. The large number of opencast coal mines in the region, together with the historical nature of the mining in the Witbank region (over 100 years of mining history) will most likely have desensitised local residents and frequent travellers through the area. On the contrary, the visibility of the mining areas from the surrounding areas could be of interest to passers-by, especially since coal mining is an important part of Mpumalanga's history, and visits to coal mines are even cited as being of interest to tourists.	Visual impacts of the discard facility would result from the removal of vegetation and the, stockpiling of soil and spoils, changes in topography and the general sense of place associated with the pre-mining landscape. In addition, much of the surface infrastructure at Greenside Colliery has resulted in topographical elevations within the surface land use area, thereby altering the visual 'sense of place' from that associated with the pre-mining agricultural land use.
4			*In situ* rehabilitation of discard disposal facilities and the continued utilisation of some water management infrastructure mean that the resultant permanent change in topography will also result in permanent changes to the visual aspects of the study area.
5	**Topography, Land use and Visual aspects**	The Greenside Colliery is located in a region where opencast coal mining is common place. The large number of opencast coal mines in the region, together with the historical nature of the mining in the Witbank region (over 100 years of mining history) will most likely have desensitised local residents and frequent travellers through the area. On the contrary, the visibility of the mining areas from the surrounding areas could be of interest to passers-by, especially since coal mining is an important part of Mpumalanga's history, and visits to coal mines are even cited as being of interest to tourists.	Rehabilitation of discard facility and footprint areas remaining once infrastructure has been removed to agricultural land capability and grazing land use will contribute to the restoration of the pre-mining 'sense of place' associated with the agricultural areas in the Mpumalanga Highveld region.

6	**Topography**	Large sections of the Emalahleni Municipal area affected by shallow undermining, which has had a significant impact on the environment, resulting in sinkhole formation, subsidence and seepage of water from underground workings (ELM IDP, 2009-2010), amongst others.	Restoration and improvement of the topography at Greenside Colliery will have consequent impacts on surface water, visual aspects, and safety of future land users, amongst others.
8	**Soil, land capability and Socio-economic conditions**	Agriculture is one of the largest economic sectors in Mpumalanga, producing 15% of total output in South Africa (South Africa Yearbook, 2001/02). The number of opencast mines in Mpumalanga, particularly large operations, has led to a significant loss of high agricultural potential soils that would otherwise continue to be capable of supporting crop cultivation. Loss of high potential agricultural land due to opencast mining activities in the area will reduce the food production capability of the region.	The contribution of the mine to this cumulative impact will increase progressively as mining advances.
9	**Soil, land capability, biodiversity and sensitive landscapes**	In addition, large areas of the surface have been affected by agriculture and opencast mining, which has led to loss of soil structure and function, and ultimately to loss of biodiversity due to the transformation and fragmentation of natural habitats and ecosystems.	
10	**Land use and Socio-economic conditions**	Mining is an important sector in Mpumalanga providing jobs and contributing to over one fifth of Mpumalanga's Gross Geographic Product (Mpumalanga SoE, 2003).	The temporary change in land use to mining will result in a much higher income per hectare of land over the short-term in comparison with agriculture.

11	**Biodiversity - Alien species**	Invading alien plants are the single biggest threat to plant and animal biodiversity through the effects of predation, alteration of habitat or disruption of ecosystem process and services. Invading alien plants have become established in over 10 million hectares of land in South Africa. If left uncontrolled, the problem will double within 15 years. Invading alien plants waste 7% of our water resources, reduce farming productivity, intensity flooding and fires, cause erosion, degrade river systems, increase rate of siltation of dams and estuaries, reduce water quality and can cause extinction of indigenous plants and animals (Mpumalanga SoE, 2003).	Alien and invasive species tend to establish in disturbed surface areas at Greenside Colliery, which will be abundant during opencast mining. Unless appropriately managed, it is likely that alien and invasive species will encroach into natural vegetation areas, and especially into areas that are newly disturbed or rehabilitated.
12	**Biodiversity - Threatened species**	Numerous species in Mpumalanga face the risk of extinction due to factors such as habitat loss, environmental degradation and fragmentation of landscapes (Mpumalanga SoE, 2003).	Grass owls (*Tyto capensis*), with a Red Data status of 'Vulnerable', occur within the mine boundary area. The impacts of mining, in terms of noise, ground vibrations, surface water and groundwater impacts will severely affect the habitat of the Grass owls, and may lead to the loss of life of the owls. Furthermore, the increase in human presence on site will contribute to the migration of this species but the lack of suitable habitat in the surrounding areas may further contribute to loss of animal life.

13	**Surface water**	The bulk (65%) of water resources available in Mpumalanga comes from surface water resources, water transfers into the province provide 19% of total **water availability,** groundwater contributes 6% of available water and return flows from mining, industrial, irrigation and urban sectors contribute 10%. Water use in South Africa is dominated by irrigation and Mpumalanga province is no exception with 46% of its water being used for irrigation. The second largest requirement for water is for water transfers to neighbouring catchments and Water Management Areas(WMAs) which accounts for 16% of water use in the province, while water use in the urban sector is slightly less (8%) and requirements for the industrial, forestry and mining sectors each account for 9% of the provinces water use (Mpumalanga SoE, 2003).	The containment of contaminated water in pollution control facilities at Greenside Colliery will lead to a decrease in the MAR available to the affected catchments. This applies to both the Operational and Post Closure Phases for containment and decants management respectively.
14		**Water quality** indicators have shown a general decrease in water quality over time. Median levels of surface water nutrients have increased and indicate a potential for enrichment. The consequences of these elevated levels are: * A greater potential for algal blooms; * An impact on riverine ecosystems; and * Impairment of human health. High (and increasing) total dissolved solids (TDS) levels in the Olifants Water Management Area (WMA) have the potential for decreasing the aesthetic value of the water. Exceedance of the guideline levels for certain metals in the Olifants WMA may be attributed to the numerous industrial and mining activities taking place in that area. At the WMA scale, high exceedance above water quality guideline levels exist for pH levels in the province.	If contaminated surface water (including decanting acid mine water) is discharged, or allowed to flow to the receiving environment, the water quality in the receiving environment would further deteriorate. Downstream users and aquatic habitats would be negatively affected by such discharge, and the wetlands in downstream receiving areas would also be negatively impacted.

15	**Groundwater**	Groundwater contributes 6% of available water in Mpumalanga (Mpumalanga SoE, 2003).	The extent and quality of pollution plumes emanating from mining areas will affect the overall groundwater quality in the area. This could impact on the water users in the area.
16		Groundwater is used for irrigation and domestic consumption in the surrounding agricultural region. Groundwater levels are drawn down at all operational mines in the region, leading to an overall impact on groundwater levels but have also lead to a complicated flow of groundwater between mines.	Development of draw down cones during the Operational Phase will occur due to the dewatering of mining operations. This will affect the regional groundwater level during the Operational Phase, but once dewatering ceased, groundwater levels are expected to recover.
17	**Air quality**	Air quality is an issue of concern in Mpumalanga, as it is in many other parts of South Africa. A wide variety of air pollution exist in Mpumalanga, ranging from veld fires to industrial processes, agriculture, mining activities, power generation, paper and pulp processing, vehicle use and domestic use of fossil fuels (Mpumalanga Province, 2002).	Dust generated by drilling and blasting activities as well as the transport of coal along gravel roads will cause an increase in the fugitive dust in the area.
18			Emission of carbon dioxide in exhaust fumes and smoke is generally of little consequence in isolation, but contributes to the regional air quality problems in Mpumalanga, and also to the larger, global issue of climate change.
19	**Noise**	Noise generated by mining activities is related to blasting and use of equipment and vehicles. However, noise is directional, and dissipates with distance. The spatial distribution of mines and related operations in the region reduces noise impacts inherently. However, when the noise is generated near residential areas, the location of the I&APs within the noise transmission paths together with the actual generation of noise cumulatively increases the significance of the impact.	Noise impacts on nearby residential locations.

20	**Socio-Economic**	The annual household income for Mpumalanga remains fairly low, with most households earning less than R18 000 per annum. Adult literacy has improved in the past two decades, but still remains below the national average and many scholars do not complete their matriculation exams. Approximately 33% of the provinces population is unemployed.	Greenside Colliery currently provides jobs for 914 people and funds and participates in community projects. The positive impacts of Greenside Colliery on the regional socio-economic conditions during the Operational Phase are discussed in Part 5.
21		Mine closure will raise unemployment levels in the region, and would increase significantly as more mines close down.	All positive impacts of the mine on the socio-economy that will have taken place during the Operational Phase will wane during the Decommissioning Phase until they cease, mainly due to the reduction or cessation of jobs and the cessation of demand for goods and services.
22			Rehabilitation of the surface to support 90% of the pre-mining land capability means that future land use of the site will be sustainable over the long-term. Use of the land for agricultural purposes such as crop cultivation or grazing will enable the contribution of future land users to the local and regional socio-economy through food production and agricultural job creation.
23	**I&APs**	The use of provincial roads by heavy duty vehicles for the haulage of coal from the mines in the region leads to the deterioration of the public roads and increased safety hazards for all road users, particularly in poor visibility conditions which occur frequently on the Mpumalanga Highveld due to the weather (mist).	Heavy goods vehicles are used to transport coal from the Greenside Colliery to the domestic market. Coal is mainly transported by rail and conveyor, and so Greenside Colliery does not contribute significantly to the increased road hazards in the region.

24		I&APs are generally affected indirectly by direct impacts of mining and related activities on environmental aspects. The location of I&APs in relation to the mining and related activities strongly influences the severity of the impacts.	Impacts on air quality, noise, vibrations, surface water, groundwater and visual impacts will cumulatively impact on I&APs

6.3 Conclusion and recommendations

In general the expected environmental impacts from the construction and operation of the discard facility and associated infrastructure do not indicate that the proposed activities would have irreversible detrimental effects on the receiving environment.

The continuation of new discard facility project can be carried out with low environmental impacts on the site and no significant impact on the surrounding area. The on-site impacts can be mitigated to a large extent and most of the impacts can be described as medium term.

7. IDENTIFICATION OF KNOWLEDGE GAPS AND PLAN OF STUDY FOR EIA

In accordance with of Regulation 28 (of Regulation 543) of the EIA Regulations (2010), under the NEMA, 1998, the knowledge gaps identified and a description of the tasks that will be undertaken as part of the EIA process, including any specialist reports or specialised processes (including the manner in which such tasks will be undertaken), are discussed in this part of the Scoping Report.

7.1 Knowledge Gaps

The following knowledge gaps and uncertainties have been identified during the scoping process of the proposed new discard facility and require further investigations that will be comprehensively carried out as part of the EIA process for the proposed project:

- All relevant specialist studies need to be conducted for the area associated with the proposed new discard facility. The studies identified during the Scoping Phase include a Wetland study, Fauna and Flora Study and Geohydrological study.
- While impacts have been identified as part of the scoping process, it is required as part of the EIA Phase to fully quantify impacts to all aspects of the environment.
- High level designs are being developed for the proposed new discard facility and the associated infrastructure; these designs will be presented as part of the final EIR.

7.2 Plan of Study

7.2.1 Tasks to be undertaken as part of the EIA process

The EIA process, which will be undertaken subsequent to the Scoping Process, will be conducted in accordance with Regulations 31 of the EIA Regulations R.543 (2010), under the NEMA (1998). The EIR document for the proposed project will include detailed information pertaining to anticipated or potential impacts that may be associated with the proposed project.

The EIR (and a draft Environmental Management Programme under the NEMA (1998) as per the EIA Regulations R.543 (2010)), will reflect amongst other, the following:

- Details and expertise of the independent EAP.
- A detailed description of the proposed activity and its location.
- An assessment of the environment likely to be affected by the proposed activity.
- Details of the Public Participation Process followed.
- An assessment of the need and desirability of the proposed activity including potential alternatives and their advantages and disadvantages.
- A description of the methodology in determining the significance of the potential environmental impacts.

- An assessment of the identified alternatives and their impacts of the proposed activity on the environment, including cumulative impacts on the environment.
- A summary of the findings of all specialist reports generated (No specific requests have been received from the competent authorities to date).
- A description of environmental issues and potentially significant impacts including a description of the nature, extent, duration, probability, reversibility, loss of irreplaceable resources and degree of mitigation of impacts. Cumulative impacts will also be assessed.
- Identification of knowledge gaps, assumptions and uncertainties.
- An environmental impact statement as well as an opinion whether the activity should be authorised or not.
- A Environmental Management Programme including, amongst other, environmental management objectives and goals, mitigation measures and management of significant impacts, description of persons responsible for mitigation implementation, description of time periods applicable to mitigation implementation, and monitoring and performance assessment.
- Inclusion of technical and supporting information.

The process of undertaken to compile the EIR (and a draft Environmental Management Programme under the NEMA (1998) as per the EIA Regulations R.543 (2010)), will include amongst other, the following:

- Commence with the compilation of the EIA under the NEMA (1998) as per the EIA Regulations R.543 (2010) [Regulation 543 (31)]
- Provide the draft EIA (including a draft EMP) to the client for input prior to public and authority comment.
- Conduct a Public Participation Process in accordance to EIA Regulations R.543 (2010), including providing the draft EIA Report to the competent authority as well as for public comment for a period of 60 days [Regulation 543(56)].
- Consider all objections and representations received during the Public Participation Process and finalise the EIA.
- Provide the final EIA (including a draft EMP) to the client for input.
- Prior to the submission of the final report to the DEDET, the I&APs will be provided opportunity to comment on the final EIA Report in terms of the requirement of Regulation 543(56)(6).
- Comments on the final EIA report by I&APs should be submitted directly to the DEDET and copied to the applicant and EAP.
- The final EIA will be submitted to the DEDET after which they have 60 days, after acknowledging receipt of the final EIA Report to consider it and in writing accept or reject the report or request additional information or amendments to the document [Regulation 543(34)(2)].
- A final Authorities meeting will be scheduled to present the submitted documentation and verify progress with the approval process of previously submitted documentation.
- Continued consultation with the relevant authority until issuing of the decision.

7.2.2 Stages at which the competent authority will be consulted

The stages at which the DEDET will be consulted in the process of compiling the EIR (and a draft Environmental Management Programme under the NEMA (1998) as per the EIA Regulations R.543 (2010)), will include amongst other, the following:

- During the Public Participation Process in accordance to EIA Regulations R.543 (2010), the draft EIR will be provided to the competent authority as well as for public comment for a period of 60 days [Regulation 543(56)].
- The final EIR will be submitted to the DEDET after which they have 60 days, after acknowledging receipt of the final EIR to consider it and in writing accept or reject the report or request additional information or amendments to the document [Regulation 543(34)(2)].
- A final Authorities meeting will be scheduled to present the submitted documentation and verify progress with the approval process of previously submitted documentation.
- Continued consultation with the relevant authority until issuing of the decision.

7.2.3 Methodology of assessing the environmental issues

Regulation 31 (of Regulation 543) of the EIA Regulations (2010), under the NEMA (1998), requires that an EIR includes an assessment of the status, extent, duration, probability, reversibility, replaceability of resources and mitigatory potential of the major potential environmental impacts of the proposed mining operation be undertaken.

Different impacts are associated with the construction and operational phases of the proposed activity. The significance will be determined by both the extent and duration of the impact. The environmental risk of any aspect is determined by a combination of parameters associated with the impact. Each parameter connects the physical characteristics of an impact to a quantifiable value to rate the environmental risk. A description of the parameters used in this impact assessment is listed in the table below.

Table 161: *Environmental impact assessment parameters*

Parameters	Description
Extent	Refers to the physical or geographical size that is affected by the impact. It can be categorised into the following ranges: • Onsite – Within specific site boundary (weight value – 1) • Local – Within municipal boundary (weight value – 2) • Regional – Outside municipal boundary (weight value – 3)
Duration	Time span associated with impact: • Short term – 1 Year or less (weight value – 1) • Medium term – 1-5 Years (weight value –2) • Long term – Longer than 5 Years (weight value – 3)

Intensity and reversibility	The severity of an impact on the receiving environment: • Low – Natural and/or cultural processes continue in a modified way and is reversible (weight value – 1) • Medium – Natural and/or cultural processes stop and is partially reversible (weight value – 2) • High – Natural and/or cultural processes disturbed to an irreversible state (weight value – 3)
Significance of Impact / Consequence	Adding the extent, duration and intensity together provides the significance of the impact (High, Medium or Low). **Extent + Duration + Intensity = High/Medium/Low Impact**
Probability	The likelihood of an impact occurring: • Unlikely – 0% - 45% chance of the potential impact occurring (weight value – 1) • Possible – 46% - 75% chance of the potential impact occurring (weight value – 2) • Likely - >75% chance of the potential impact occurring (weight value – 3)
Environmental Risk Refer to Table 15 below	Multiplication of the significance of the impact by the probability of the impact occurring produces a final conclusion of the overall risk that an impact poses to the surrounding environment. **High/Medium/Low Impact X Probability = High/Medium/Low Environmental Risk**

Significance of Impact				
		Low Impact (3 → 5)	Medium Impact (6 → 8)	High Impact (9)
Probability	Definite / Very Likely 3	9 - 15 L - M	18 - 24 M - H	27 H
	Possible 2	6 - 10 L - M	12 – 16 M	18 M - H
	Unlikely 1	3 - 5 L	6 – 8 L	9 L

ENVIRONMENTAL RISK	Guidelines for Control Strategies
(H) - High	Proactively reduce risk level, short term response.
(M- H) Medium to High	Proactively reduce risk level, short term response.
(M) – Medium	Management strategies to reduce risk level, short to medium term response.
(L – M) Low to Medium	Management strategies to reduce risk level, short to medium term response, operational control and housekeeping.
(L) - Low	Operational control and housekeeping.

7.2.4 Public participation during the EIA process

The process of undertaken to compile the EIR (and a draft Environmental Management Programme under the NEMA (1998) as per the EIA Regulations R.543 (2010)), will include amongst other, the following public participation:

- The draft EIR (including a draft EMP) will be provided to the Client for input prior to public and authority comment.
- The Public Participation Process be conducted in accordance to EIA Regulations R.543 (2010), including providing the draft EIA Report to the competent authority as well as for public comment for a period of 60 days [Regulation 543(56)].
- Hereafter all objections and representations received during the Public Participation Process will be considered for finalising the EIA.
- Prior to the submission of the final report to the DEDET, the I&APs will be provided opportunity to comment on the final EIA Report in terms of the requirement of Regulation 543(56)(6).
- Comments on the final EIA report by I&APs will be submitted directly to the DEDET and copied to the applicant and EAP.

I&APs will include land owners / users, adjacent land owners / users, regulatory authorities, key stakeholders, and any I&APs registering as part of the Public Participation Process for the project.

7.2.5 Alternatives

Alternatives will continue to be investigated by discussion with Authorities, I&APs, and the client, and the 'No Project Option' will be included in the assessment. The EIA (including EMP) document will include the alternatives identified and investigated for the mentioned project as well as the advantages and disadvantages of each. Refer also to Part 5 for more details pertaining to alternatives being considered, including the 'No Project' Option.

8. DISCUSSION AND CONCLUSION

It is the purpose of this part of this Scoping Report to summarise the potentially significant findings of the scoping process. A short description of the key aspects relating to the Public Participation Process, the significant impacts on the various aspects of the environment, the knowledge gaps identified as part of the EIA process of the proposed project are included below.

The details pertaining to the proposed project have been fully described in Part 2 of this report. The current state of the environment has been described in Part 3 of this document.

8.1 Public Participation Process

A full Public Participation Process in terms of the requirements of the NEMA, 1998 has been undertaken as part of the Scoping Process. Issues of concern raised during this process will be used to focus the specialist studies of the EIA on the potentially significant impacts associated with the proposed project. Part of this process is also to identify project alternatives, and to determine the feasibility of these alternatives, in the context of financial, practical and environmental aspects.

Part 4 of this Scoping Report explains in detail the process that has been undertaken thus far to involve the I&APs in the Scoping Process of project. The following tasks have already been performed as part of the Public Participation Process:

- The project has been advertised in the Witbank News newspaper.
- The project has been advertised with the use of on-site notices.
- Background Information Documents have been distributed.
- A public meeting was held on the 23rd of January 2013.

8.2 Alternatives identified

The following alternatives were identified as part of the Scoping Process for the proposed project:

- Alternative access to the discard facility and associated infrastructure.
- Alternatives in terms of the location of the discard facility.
- Land use development alternatives.

8.3 Identified potentially significant impacts

A number of potentially significant impacts have been identified during the scoping process. Specialist studies are in the process of being completed, and additional potentially significant impacts may be highlighted at a later stage. The extent of the identified potentially significant impacts will be quantified, and will be reported on as part of the EIA document.

Part 6 of this Scoping Report includes more detail pertaining to the identified possible impacts that will be assessed and quantified during the EIA phase of the project.

8.4 Further investigations

The EIA Regulations dated 2010, under the NEMA, 1998, states that a Scoping Report, must, amongst others, describe the nature and extent of further investigations required in the EIA Report. Consequently, in compliance with the mentioned Regulations, the following specialist studies have been identified and are in the process of being completed (refer also to Part 6):

- Geohydrological Study.
- Fauna and Flora Study.
- Wetland Study.

8.5 Conclusion

This scoping process has been carried out in accordance with the NEMA, 1998, and the Regulations there under.

The potential impacts due to the proposed new discard facility and associated infrastructure and their expected significance have been identified in Part 6 of this Scoping Report. Mitigation measures to address possible environmental impacts of the mining and related activities of the project will be included in the EIA document that will be submitted to the MDEDET in the near future.

I&APs have been identified and will be involved in the Scoping process to provide their input with regards to the identification of potential impacts and alternatives for the proposed project. This input as well as any additional input received during the EIA Phase will be used to focus the EIA process on the important issues, and to ensure that proper planning takes place in order to promote sustainable development. The concerns raised by I&APs will be addressed in the EIA as required by the relevant Regulations under NEMA, 1998.

Based on the findings of the Scoping Phase, it is recommended that the “No-Project” option not be considered yet for the proposed project, and that the project viability be assessed further.

The EIA process, which will subsequently follow, will be conducted in accordance with the EIA Regulations, under the NEMA, 1998.