



mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

Basic Assessment Report And Environmental Management Programme

for the construction and operation of a pipeline for the conveyance of water from the Tweefontein Water Reclamation Plant to the Mbali Colliery

DRAFT REPORT

SUBMITTED FOR ENVIRONMENTAL AUTHORISATIONS IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT NO. 107 OF 1998) (NEMA) AND THE NATIONAL ENVIRONMENTAL MANAGEMENT WASTE ACT, 2008 (ACT NO. 59 OF 2008) (NEM:WA) IN RESPECT OF LISTED ACTIVITIES THAT HAVE BEEN TRIGGERED BY APPLICATIONS IN TERMS OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002 (ACT NO. 28 OF 2002) (MPRDA) (AS AMENDED).

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This document has been prepared by Digby Wells Environmental.

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Project Name:	Basic Assessment Report and Environmental Management Programme Report for the construction and operation of a pipeline for the conveyance of water from the Tweefontein Water Reclamation Plant to the Mbali Colliery
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IMPORTANT NOTICE

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

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

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

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

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

OBJECTIVE OF THE BASIC ASSESSMENT PROCESS

The objective of the basic assessment process is to, through a consultative process—

- determine the policy and legislative context within which the proposed activity is located and how the activity complies with and responds to the policy and legislative context;
- identify the alternatives considered, including the activity, location, and technology alternatives;
- describe the need and desirability of the proposed alternatives,
- through the undertaking of an impact and risk assessment process inclusive of cumulative impacts which focused on determining the geographical, physical, biological, social, economic, heritage, and cultural sensitivity of the sites and locations within sites and the risk of impact of the proposed activity and technology alternatives on the these aspects to determine:
 - the nature, significance, consequence, extent, duration, and probability of the impacts occurring to; and
 - the degree to which these impacts—
 - can be reversed;
 - may cause irreplaceable loss of resources; and
 - can be managed, avoided or mitigated;
- through a ranking of the site sensitivities and possible impacts the activity and technology alternatives will impose on the sites and location identified through the life of the activity to—
 - identify and motivate a preferred site, activity and technology alternative;
 - identify suitable measures to manage, avoid or mitigate identified impacts; and
 - identify residual risks that need to be managed and monitored.

EXECUTIVE SUMMARY

Introduction

The Mbali Colliery is owned and operated by Mbali Coal, a wholly owned subsidiary of HCI Coal (Pty) Ltd (HCI Coal) and is situated approximately 10 km south of the town Ogies adjacent to the Ogies – Bethal Road in the Mpumalanga Province. The Mbali colliery is located on portions 16, 17, 20, 31 and the Remaining Extent (RE) of portion 9 of the farm Klippoortjie 32 IS. The Mbali Colliery Mining Right (Reference No. MP 30/5/1/2/2 228 MR) was granted by the Department of Mineral Resources (DMR) in June 2008 and is valid until 25 June 2018. It is proposed that the mining right will be extended. The application for this extension will be submitted to the DMR prior to the expiration of the mining right.

Mbali Colliery began operating in October 2013 with an extraction rate of 150 000 tonnes per month. The coal is mined from the number 4 and 5 seams using standard opencast mining methods. Run-of-Mine (RoM) coal is extracted through truck and shovel methods and hauled to the coal wash plant located on the mine. The coal wash plant obtains water through the pumping of water from the mine's open pits and the Pollution Control Dam (PCD) located on site.

The colliery is currently experiencing water shortages due to regional drought. Additionally, HCI Coal proposes to continue the use of the plant in toll washing agreements after cessation of mining at Mbali Colliery. Cessation of Mining at Mbali would mean that water from the open pits will no longer be available for use in the Plant.

Therefore, Mbali Colliery requires an additional source of process water to continue operating its wash plant. Mbali Colliery is proposing to source water from the Tweefontein Water Reclamation Plant (TWRP) which is situated at the Goedgevonden (GGV) Mine. Operational Management of TWRP has been contracted to Glencore Operations South Africa (Pty) Ltd (Glencore). The TWRP is situated approximately 3.6 - 4 km north of Mbali. Glencore has agreed, in principle to supply water to Mbali from the TWRC.

HCI Coal have appointed Digby Wells as the independent Environmental Assessment Practitioner (EAP) to undertake the required Basic Assessment (BA) Process in accordance with the National Environmental Management Act, 1998 (Act 107 Of 1998) (NEMA), in support of the required authorisations for the proposed 3.6 - 4 kilometres (km) pipeline to be constructed between TWRP and Mbali Colliery for the transfer of water.

Project Applicant

The particulars of the applicant are detailed in the table below.

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Environmental Consultants

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Project Overview

The Mbali colliery is currently experiencing water shortages due to regional drought and requires an additional source of process water to continue operating its wash plant. Additionally, HCI Coal proposes to continue operation of the plant in toll washing agreements after the Mbali pits are closed. Therefore Mbali Colliery is proposing to source water from the TWRP which is operated by Glencore.

The TWRP is situated approximately 3.6 - 4 km north of Mbali. Glencore has agreed, in principle to supply water to Mbali from the TWRP which is currently being discharged to the environment in accordance with their Water Use License (WUL). To facilitate the water supply, HCI Coal will have to construct (and licence) a pipeline for the conveyance of water (clean / raw water depending on the agreement reached between Glencore and HCI) from the TWRP to the Mbali Colliery.

The design capacity of the pipeline will be 2 Ml/day (2,000 m³ per day at around 30 l/s). The pipeline diameter will be around 250 mm (0.25 – 0.35 m) and the length is approximately 3.6 – 4 km. The pipeline servitude width is 5 metres. The proposed pipeline route is from the TWRP in a south-easterly direction along the R545 for approximately 1.6 km, and along the existing Mbali access road in a southerly direction for approximately 2 km. The pipeline route crosses the railway, various roads and the Klippoortjiespruit just south of the TWRP.

Detailed engineering designs are still underway, however it is anticipated that the pipeline will be above-ground at the connection point to the TWRP, from where it will be underground up to the connection point with the Mbali Mine. The pipeline will also daylight at the crossing with the Klippoortjiespruit and be attached to the existing bridge at this section. The pipeline is proposed to be constructed underneath all roads which it must cross between TWRP and the Mbali Colliery. However this will only be confirmed once further discussions are had with SANRAL who are responsible for the road network.

Agreements between HCI Coal and Glencore have also not been finalised. It can therefore not currently be confirmed if the water conveyed in the proposed pipeline will be raw water, or treated water. In accordance with the precautionary principle, this report assumes that raw water will be conveyed in the pipeline between the two mines.

It is proposed that once Mbali Colliery reaches LOM it will source coal from other operations and process coal in the existing plant at Mbali. Therefore the pipeline and coal wash plant will remain in operation even after the mine ceases mining operations and is rehabilitated.

Approach and Methodology for the Public Participation Process

The Public Participation Process (PPP) was developed to ensure compliance with environmental regulatory requirements and to provide Interested and Affected Parties (I&APs) with an opportunity to evaluate the project. During this process stakeholders are able to provide inputs and to receive feedback from the environmental specialists and/or proponent.

A summary of the PPP activities undertaken during the basic assessment process are provided in Table 10-1 of this report. Consultation with I&APs during the basic assessment process was undertaken as follows:

- **Background Information Document (BID):** a BID which included a project description, information about the relevant legislation, the competent authorities and details of the appointed EAP was prepared and distributed on 22 February 2018. The BID was also accompanied by a Registration and Comment Form for stakeholders to use for formal registration as I&APs or to submit comments. Information regarding the availability of the Draft BAR was also provided, and I&APs were asked to comment.
- **Newspaper advertisement:** a newspaper advertisement was placed in the Witbank News, on 22 February 2018, which is a local newspaper that distributes to Witbank and surrounding areas (including Ogies and the area where Mbali Colliery is located). The advert was published in English and included a brief project description, information about the relevant legislation, the competent authorities, details of the appointed EAP, registration process for I&APs, and information regarding the availability of the Draft BAR for public comment.
- **Site notices:** Site notices were put up at various places. The site notices contained a brief project description, information about the relevant legislation, the competent

authorities and details of the EAP, registration process for I&APs and information regarding the availability of the Draft BAR for public comment.

The BAR has been made available for a public comment period of 30 days from 23 February 2018 to 26 March 2018 at the Ogies Public Library and on the Digby Wells website: www.digbywells.com (under Public Documents). Once the commenting period is reached the Draft BAR will be updated and submitted to the DMR for consideration. Simultaneously, the updated BAR will be made available to I&APs on the Digby Wells website and I&APs will be informed of such by means of a letter (email and post). This enables I&APs to verify that their comments have been captured and responded to.

Project Alternatives

As discussed in Part A Section 9 of this report, various alternatives to the proposed pipeline have been investigated to ensure the most suitable and preferable alternatives are selected to ensure the least number of impacts on the environment occur, and that those impacts that are unavoidable are managed to an acceptable level of significance. The motivation for the preferred alternatives has been discussed below:

Preferred Pipeline Route Alternative

Although various other route alternatives were investigated during the pre-application process only two routes as discussed below and shown in Plan 4 in Appendix B. These route options were investigated further due to the lesser impacts on the environment from the two selected routes.

Route A, has been selected as the preferred route. Route A is the shortest route and associated with the least vegetation clearance. The route has also been selected as it crosses the least number of roads compared to Route B. The pipeline is proposed to be located within the road reserve as this area has already been impacted upon. Both Route A and B crosses rivers, roads and railways. Pipeline Route A has been selected as the preferred route as only one river (the Klippoortjiespruit) is crossed which is unavoidable.

Preferred Water Source Alternative

The proposed pipeline to transport water from the TWRP to the Mbali Colliery is considered to be the preferred alternative and the only alternative which has been investigated in detail in this report.

The alternative has been selected as the route is considered to be the shortest. Alternative mines which could provide Mbali with water are further away resulting in increased pipeline length and associated impacts.

Additionally the financial cost in constructing the pipeline is considered to be more feasible for the construction of a shorter route than a longer route. The water that is proposed to be utilised has already been impacted from mining. Abstracting water from groundwater or surface water sources would increase the impact on the water regime in the area which would previously not be impacted. Additionally the water sources in this area are considered



to be limited and therefore abstraction from natural sources is not considered a feasible option.

Preferred Design Alternative

It is proposed that the pipeline will be constructed above ground at the connection point to the TWRP, from where it will be underground up to the connection point with the Mbali Mine. The pipeline will also daylight at the crossing with the Klippoortjiespruit and be attached to the existing bridge at this section. This option will prevent the pipeline from being stolen (which would result in economic losses to HCI Coal, and in the sudden discharge of potentially contaminated water to the environment).

Impact Assessment Summary

The impacts associated with the Construction and Decommissioning Phases of the proposed project are expected to be of low / minor significance. The impacts of concern are related to potential contamination of soils, surface water, groundwater, aquatics and wetlands due to hydrocarbon spillages from vehicles and machinery used. In order to mitigate these potential risks, hydrocarbon spillages must be cleaned up immediately to prevent further contamination. Soils are likely to be impacted upon due to the pipeline and vehicles which can lead to soil erosion, although limited to a small spatial scale. Additionally soil stockpiles which will be created alongside the area where the pipeline will be constructed may be impacted during heavy rainfall events which can result in significant erosion and sedimentation of the water resources especially within a 100 metre buffer of the Klippoortjiespruit. Erosion prevention must be implemented especially if construction cannot be limited to the dry season.

The area which will be impacted by the construction of the pipeline must be rehabilitated to ground level with no indentations. Should indentations occur this could lead to the creation of trenches through increased erosion. Vegetation establishment (where vegetation was previously cleared for the pipeline construction) will remain first priority once the pipeline has been constructed and rehabilitated. It should be noted however that along the road reserve most of the soil is compacted and no vegetation has been established this has been done due to safety requirements and to protect the integrity of the road. Therefore, where this is found it is recommended that once the pipeline has been constructed the soil is re-compacted; vegetation re-establishment is considered unnecessary in these areas.

Two moderate potential impacts have been identified during the operational phase of the pipeline as the water being transferred from the TWRP to Mbali Colliery is considered to be dirty water. Therefore should a leak in the pipeline occur, water qualities from the TWRP may exceed the Klippoortjiespruit Water Quality Objectives (WQO) which could potentially impact on the water quality within the Klippoortjiespruit. A negative impact on the water quality may impact the water resources within the area, as well as inhibiting the ecological functioning of the wetlands. Additionally should a sudden burst within the pipeline occur, this could potentially lead to an increased amount of water being deposited downstream which

can lead to increased erosion as well as effects on downstream water users. Pipeline maintenance and monitoring of the volumes of water conveyed must be undertaken daily.

It is also noted that Mballi is currently experiencing contamination issues of the water course which runs through the operation. Elevated levels of TDS were recorded at three monitoring points. The surface water monitoring point immediately upstream of the Mine does not show elevated TDS. The TDS increases as the stream flows through the Mine. It is anticipated that the contamination is as a result of overflows from the slurry ponds or channel, or failure of the slurry ponds' or channel liners. Therefore the increased quantity of water from the pipeline being utilised in the coal wash plant and being captured into Mballi's dirty water channels and PCD could potentially result in an overflow and further contamination of the stream (cumulative impact). It should be noted that the PCD although able to contain the increased quantity of water from the pipeline often silts up and therefore improved dirty water management needs to be undertaken to ensure the PCD does not silt up, and retains its capacity to sufficiently contain the increased amount of water to prevent surface water contamination.

Mitigation measures have been proposed to address these identified impacts and therefore it is not anticipated that any moderate impacts associated with the pipeline will occur.

Positive impacts associated with the construction, operation and decommissioning of the pipeline have also been identified. It is anticipated that jobs will be created during both construction and decommissioning phases. However this impact is considered to be a minor positive impact as limited jobs will be created and the construction and decommissioning phases will not exceed four months. A more positive impact is associated with the operational phase through the creation of indirect jobs. Although no jobs will be created directly from the operation of the pipeline, it is anticipated that through the operation of the pipeline, Mballi's coal wash plant will continue to be operational. Additionally jobs created from the coal wash plant may even be preserved after Mballi Colliery reaches life of mine, as it is anticipated that the coal wash plant will remain operational.

Conclusions and Recommendations

The Mballi Colliery supplies coal to the local markets which assists with economic growth and development. The mine operates as an open cast operation and utilises a wash plant to wash the coal. As the colliery is currently experiencing water shortages, the wash plant can no longer operate optimally due to the limited water available within the pits and PCD. The proposed construction and operation of the pipeline between TWRP and Mballi Colliery will assist in providing water to the coal wash plant. This will ensure the continuation of the mining operation in its current state. Once Mballi Colliery reaches LoM it will lead to a downgrade of the economic wealth within the local community from the mining operation. It is therefore proposed that once Mballi Colliery is decommissioned, HCI Coal will source coal from other operations and process coal in the existing plant at Mballi. Therefore the pipeline and coal wash plant will remain in operation even after the mine ceases mining operation

and is rehabilitated. This will assist in lessening the impacts associated with the decommissioning of the Mbali Colliery.

Mbali Colliery currently provides the local market with a total of 89 direct job opportunities. Of this a total of 41 Employees are in the Engineering Department, 27 employees are employed as office staff and 21 employees are directly involved in the operation of the coal wash plant. The construction and operation of the pipeline to supply water to the coal wash plant and ensure its continued operation will ensure the prevention of job losses associated with plant decommissioning. In addition to the employment provided by Mbali Coal Directly, their mining contractor, Diesel Power, employs 178 people.

It should also be considered that during the construction phase it is anticipated that 8 jobs will be created over a period of four months which will have a short term positive impact on the social environment. No jobs are however anticipated to be created once the pipeline becomes operational as the operation of the pipeline is not labour intensive.

It is noted that no significant impacts or risks associated with the proposed project has been identified and with mitigation measures these impacts are considered manageable. It is therefore recommended that authorisation for the construction and operation of the proposed pipeline be granted.



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Part A: Scope of Assessment and Basic Assessment Report

1 Introduction

The Mbali Colliery is owned and operated by Mbali Coal, a wholly owned subsidiary of HCI Coal (Pty) Ltd (HCI Coal) and is situated approximately 10 km south of the town Ogies adjacent to the Ogies – Bethal Road in the Mpumalanga Province. The Mbali colliery is located on portions 16, 17, 20, 31 and the Remaining Extent (RE) of portion 9 of the farm Klippoortjie 32 IS. The Mbali Colliery Mining Right (Reference No. MP 30/5/1/2/2 228 MR) was granted by the Department of Mineral Resources (DMR) in June 2008 and is valid until 25 June 2018. It is proposed that the mining right will be extended for two additional years. The application for this extension will be submitted to the DMR prior to the expiration of the mining right.

Mbali Colliery began operating in October 2013 with an extraction rate of 150 000 tonnes per month. The coal is mined from the number 4 and 5 seams using standard opencast mining methods. Run-of-Mine (RoM) coal is extracted through truck and shovel methods and hauled to the coal wash plant located on the mine. The coal wash plant is supplied with water from the mine's open pits and the Pollution Control Dam (PCD) located on site.

The colliery is currently experiencing water shortages due to a regional drought. Additionally, HCI Coal proposes to continue the use of the plant in toll washing agreements after cessation of mining at Mbali Colliery. Cessation of mining at Mbali would mean that water from the open pits will no longer be available for use in the Plant.

Therefore, Mbali Colliery requires an additional source of process water to continue operating its wash plant. Mbali Colliery is proposing to source water from the Tweefontein Water Reclamation Plant (TWRP), which is situated at the Goedgevonden (GGV) Mine. Operational Management of TWRP has been contracted to Glencore Operations South Africa (Pty) Ltd (Glencore). The TWRP is situated approximately 3.6 – 4 kilometres (km) north of Mbali. Glencore has agreed, in principle to supply water to Mbali from the TWRP.

HCI Coal have appointed Digby Wells as the independent Environmental Assessment Practitioner (EAP) to undertake the required Basic Assessment (BA) Process in accordance with the National Environmental Management Act, 1998 (Act 107 Of 1998) (NEMA), in support of the required authorisations for the proposed 3.6 – 4 km pipeline to be constructed between TWRP and Mbali Colliery for the transfer of water.

2 Project Applicant

HCI Coal particulars are detailed in Table 2-1.

Table 2-1: Particulars of the Applicant

Applicant Name:	HCI Coal (Pty) Ltd – Mbali Colliery
Contact Person:	Victor Lebepe
Telephone No:	+27 11 448 4915

Email Address:	victori@hcicoal.co.za
Physical Address:	Gallagher Convention Centre, West Wing 3rd Level, Gallagher House, 19 Richards Drive, Midrand Johannesburg

2.1 Details of EAP

Digby Wells has been appointed by HCI Coal as the independent Environmental Assessment Practitioner (EAP) to conduct the Basic Assessment process according to the NEMA and the Environmental Impact Assessment (EIA) Regulations, 2014 (as amended), as well as the required Public Participation Process (PPP). The particulars of the EAP undertaking the Basic Assessment process is supplied in Table 2-2.

Table 2-2: Contact Details of the EAP

EAP Company Name:	Digby Wells Environmental
EAP:	Mel Pillay
Telephone No:	011 789 9495
Fax No:	011 069 6801
Email Address:	mel.pillay@digbywells.com
Physical Address:	Turnberry Office Park, 48 Grosvenor Road, Bryanston, 2191, South Africa.
Postal Address:	Private Bag X10046, Randburg, 2125

2.2 Expertise of the EAP

2.2.1 The Qualifications of the EAP

Mel Pillay is currently the Manager for the Environmental and Legal Services Department at Digby Wells Environmental. Mel has over 10 years of professional experience in Environmental Assessment and Planning and Management. Having worked for a multi-disciplinary engineering and environmental consultancies, Mel has a competent understanding of the work effort and cross collaboration required for a successful multidisciplinary organisation. Mel has been involved in a number of Environmental Impact Assessments and has a particular interest in water resource management, mining, energy (including renewables), oil and gas and stakeholder engagement. Mel has considerable experience across a range of developmental and environmental sciences and has worked in South Africa, Namibia, DRC, Mali, Tanzania and Angola and is familiar with Regulatory Environmental Legislation in other parts of Africa. Mel is very well versed in the IFC Environmental and Social Performance Standards (including IFC PS 2012) and the associated Equator Principles, which have informed the approach and standard for a

number of ESIA processes that he has managed and coordinated. Mel's CV is included in Appendix A.

2.2.2 Summary of the EAP's Past Experience

The CV of Mel Pillay, including the relevant project experience, is included in Appendix A.

3 Location of the Overall Activity

Farm Name:	The pipeline will be located in the existing road reserve along the R545, which traverses the following Farm Portions: <ul style="list-style-type: none"> ▪ Klippoortje 32 Portion 17; ▪ Klippoortje 32 Portion 4; ▪ Zaaewater 11 Portion 35; and ▪ Klippoortje 32 Portion 30 	
Application Area (Ha):	The proposed pipeline route is approximately 3.6 - 4 km in length with a diameter of 0.25 – 0.35 metres (m). The required servitude for construction of the pipeline is 5 m, Therefore the total area which the pipeline is proposed to cover is 1.8 – 2 ha. It must be noted that engineering designs have not been concluded and therefore the above dimensions are not considered to be final.	
Magisterial District:	Nkangala District Municipality eMalahleni Local Municipality eMalahleni Magisterial District	
Distance and direction from nearest town:	10 km south of the town Ogies adjacent to the Ogies – Bethal Road in the Mpumalanga Province.	
21 digit Surveyor General Code for each farm portion:	Klippoortje 32 Portion 17	T0IS00000000003200017
	Klippoortje 32 Portion 4	T0IS00000000003200004
	Zaaewater 11 Portion 35	T0IS00000000001100035
	Klippoortje 32 Portion 30	T0IS00000000003200030

4 Locality Map

The project falls within the eMalahleni Local Municipality within the Nkangala District Municipality. A regional plan and local setting plan have been included as Plan 1 and Plan 2 respectively, within Appendix B.

5 Description of the Scope of the Proposed Overall Activity

The NEMA provides the environmental legal framework for South Africa. The listed activities that require environmental authorisation have been outlined in the EIA Regulations 2014 (as amended). Together with the EIA Regulations, 2014 (as amended), the Minister published the following Regulations in terms of Sections 24 and 24D of the NEMA:

- Regulation GN R. 983 – Listing Notice 1 (as amended): This listing notice provides a list of various activities which require environmental authorisation and must follow the Basic Assessment process as described in Regulation 19 and Regulation 20 of the NEMA EIA Regulations;
- Regulation GN R. 984 – Listing Notice 2 (as amended): This listing notice provides a list of various activities which require environmental authorisation and must follow an EIA process as described in Regulation 21 to Regulation 24 of the NEMA EIA Regulations; and
- Regulation GN R. 985 – Listing Notice 3 (as amended): This notice provides a list of various environmental activities which have been identified by provincial governmental bodies. The undertaking of such activities within the stipulated provincial boundaries will require environmental authorisation and the Basic Assessment process as described in Regulation 19 and Regulation 20 of the NEMA EIA Regulations will need to be followed.

The proposed project aims to obtain environmental authorisation for the construction and operation of a pipeline to be constructed between TWRP and Mbali Colliery to ensure that the Colliery's wash plant remains operational. The following Listed Activities will be involved in the construction and operation of the pipeline as shown in Table 5-1.

5.1 Listed and Specified Activities

Table 5-1: Listed and specified activities for the proposed project

Name of Activity	Aerial extent of the activity	Listed Activity	Applicable Listing Notice
Construction and operation of the pipeline for the transfer of water from TWRP to the Mbali colliery coal wash plant - The proposed pipeline will be inside the road reserve, has a diameter of only 0.25 – 0.35 m and a throughput of only 30 litres per second. Therefore no listed activity is triggered.	Length – 3600 - 4000 m Diameter – 0.25 – 0.35 m Servitude - 5 m, Area – 1.8 - 2 ha.	N/A	N/A
Construction and operation of the pipeline over the Klippoortjiespruit may require the moving of more than 10 m ³ of material	Length – 3600 – 4000 m Diameter – 0.25 –	X – Activity 19	GNR 983 (as amended) Listing Notice 1

Name of Activity	Aerial extent of the activity	Listed Activity	Applicable Listing Notice
within the watercourse.	0.35 m Area – 0.09 – 0.14 ha.		
Clearance of vegetation for the Construction and maintenance of the pipeline - The site is located in a threatened ecosystem (Eastern Highveld Grassland (Vulnerable) and the Moist Grasslands Priority Area.	Length – 3600 – 4000 m Diameter – 0.25 – 0.35 m Area – 0.09 - 0.14 ha.	X – Activity 12	GNR 985 (as amended) Listing Notice 3

5.2 Description of the Activities to be undertaken

5.2.1 Project Location

Mbali Colliery is situated on portions 16, 17, 20, 31 and the remaining extent of portion 9 of the farm Klippoortjie 32 IS, in the Magisterial District of eMalahleni in the Mpumalanga Province. The farm is situated 10 km south of the town Ogies and 32 km south west of Emalahleni, and is accessed via the R545. The Mbali Colliery is situated within a region that is characterised by coal mining activities and agriculture. The surrounding land use is agricultural in nature and is sparsely populated by farm owners, tenants and farm labourers. Agricultural activities consist of crop farming (no irrigation is practiced) where soil conditions are favourable and livestock farming. The mines which surround Mbali Colliery include GGV mine, South Witbank Colliery, Witcons Colliery and Tavistock Colliery.

5.2.2 Land Tenure

The Project area is located on a number of properties, as shown in the Table 5-2. The regional setting and the local setting of the proposed pipeline is depicted in Plan 1 and Plan 2 respectively (refer to Appendix B). Plan 3 illustrates the land tenure Map (Appendix B).

Table 5-2: Project properties

SG_Code	Portion No.	Farm Name	Registered Owner
T0IS00000000003200017	Portion 17	Klippoortje 32	Mbali Coal Pty Ltd
T0IS00000000003200004	Portion 4	Klippoortje 32	Daniel Jacobus Steyn De Wet
T0IS00000000001100035	Portion 35	Zaaiwater 11	Glencore Operations Pty Ltd
T0IS00000000003200030	Portion 30	Klippoortje 32	Anton Theo van Der Merve

5.2.3 Mbali Colliery Mining Operation

The Mbali Colliery Mining Right (Reference No. MP 30/5/1/2/2 228 MR) was granted by the DMR in June 2008. Additionally an amendment to the Environmental Management Programme authorised in 2008 was also undertaken and granted in March 2017. An Integrated Water Use License (IWUL) was granted by the Department of Water and Sanitation (DWS) in June 2012 for various water-uses occurring at the Mbali Colliery.

Environmental Authorisation (EA) and a Record of Decision (RoD) for all listed activities applied for in terms of the NEMA was granted by the Mpumalanga Department of Economic Development, Environment and Tourism (MDEDET) in August 2012.

Coal mining commenced in October 2013 with an extraction rate of 150 000 tonnes per month. The coal is mined from the number 4 and 5 seams using standard opencast mining methods. At this rate and according to the original Mine Works Programme (MWP) the Life of Mine (LoM) would be reached in June 2018. Due to various circumstances (including demand requirements) mining occurred at a lesser rate and Mbali has another 2 years LoM remaining. It is proposed that the mining right will be extended for another two additional years. The application for this extension will be submitted to the DMR prior to the expiration of the mining right.

The current mining method is truck-and-shovel. The first step of the mining process is to remove the topsoil followed by soft overburden. The topsoil and soft overburden material is loaded by excavators onto dump trucks and stockpiled separately. This material is then used as concurrent rehabilitation when required. The topsoil is replaced as the final layer on the rehabilitated areas. Below the topsoil and soft overburden is the hard inter-burden. This comprises sandstone with clay and shale layers in between. This material needs to be drilled and blasted (cast blast) to reach the coal seam.

The coal that is extracted from the open pits is trucked to the plant where it is washed, crushed, screened and blended according to Eskom specifications. After processing, various grades of coal are extracted and stockpiled separately. The product is then transported to the power stations depending on the demand requirements.

The coarse coal discard and slurry material, of a high enough quality, is disposed of in slurry ponds where it is first allowed to dry. It is then sold mainly to Eskom for power generation as well as the surrounding brick and briquetting making industries. Remaining discard material which is not sold is backfilled into the open pit in accordance with the EMP and approved IWUL.

The water that is drained from the slurry pond is disposed of via concrete and/ or HPDE lined trenches into the PCD. The water that is contained within the PCD is utilised as process water in the coal wash plant. Additionally all water extracted from the pits and runoff from the designated dirty water areas is also pumped into the PCD and re-used.

5.2.4 Proposed Pipeline

The Mbali colliery is currently experiencing water shortages due to regional drought and requires an additional source of process water to continue operating its wash plant. Additionally, HCI Coal proposes to continue operation of the plant in toll washing agreements after the Mbali pits are closed. Therefore Mbali Colliery is proposing to source water from the TWRP which is operated by Glencore.

The TWRP is situated approximately 3.6 - 4 km north of Mbali. Glencore has agreed, in principle to supply water to Mbali from the TWRP. To facilitate the water supply, HCI Coal will have to construct (and licence) a pipeline for the conveyance of water (clean / raw water depending on the agreement reached between Glencore and HCI Coal) from the TWRP to the Mbali Colliery.

The design capacity of the pipeline will be 2 Mℓ/day (2,000 m³ per day at around 30 ℓ/s). The pipeline diameter will be around 250 mm (0.25 – 0.35 m) and the length is approximately 3.6 - 4 km. The proposed pipeline route extends from the TWRP in a south-easterly direction along the R545 for approximately 1.6 km, and along the existing Mbali access road in a southerly direction for approximately 2 km. The pipeline route crosses the Klippoortjiespruit on the existing road bridge just south of the TWRP.

Detailed engineering designs are still underway, however it is anticipated that the pipeline will be above-ground at the connection point to the TWRP, from where it will be underground up to the connection point with the Mbali Mine. The pipeline will also daylight at the crossing with the Klippoortjiespruit and be attached to the existing bridge at this section. The pipeline is proposed to be constructed underneath all roads which it must cross between TWRP and the Mbali Colliery. However this will only be confirmed once further discussions are had with SANRAL who are responsible for the road network.

Agreements between HCI Coal and Glencore have also not been finalised. It can therefore not currently be confirmed if the water conveyed in the proposed pipeline will be raw water, or treated water. In accordance with the precautionary principle, this report assumes that raw water will be conveyed in the pipeline between the two mines.

It is proposed that once Mbali Colliery reaches LOM it will source coal from other operations and process coal in the existing plant at Mbali. Therefore the pipeline and coal wash plant will remain in operation even after the mine ceases mining and is rehabilitated.

Table 5-3 provides photographic presentation of the proposed pipeline route.

Table 5-3: Photograph representation of the proposed Pipeline Route



Entrance to Mbali Colliery
26°07'24.77"S ; 29°06'35.44"E



Pipeline location along access road to Mbali Colliery
26°07'18.58"S ; 29°06'34.19"E



Location where pipeline will enter Mbali Colliery access road from the R545
26°06'44.24"S ; 29°06'52.25"E



Alien invasive vegetation along proposed pipeline route
26°06'43.80"S ; 29°06'52.72"E



Location where pipeline will be constructed along the road reserve below ground

26°06'17.37"S ; 29°06'36.65"E



Surrounding vegetation along proposed pipeline route

26°06'19.88"S ; 29°06'37.84"E



Crossing of the pipeline over the Klippoortjiespruit along the bridge

26°06'09.50"S ; 29°06'31.41"E



Vegetation around the Klippoortjiespruit

26°06'09.50"S ; 29°06'31.35"E



Downstream of where the pipeline will cross the Klippoortjiespruit
26°06'09.78"S ; 29°06'30.96"E



TWRP where water will be sourced from
26°05'53.29"S ; 29°06'16.58"E

5.2.5 Employment

The pipeline will generate approximately eight to ten employment opportunities during the construction phase. The construction phase will be approximately 4 months. Although the operational phase will not generate any new employment opportunities as the personnel already employed at Mbali Colliery will manage the pipeline, it is anticipated that the pipeline will assist in the continuation of employment opportunities once LoM is reached at Mbali Colliery.

6 Policy and Legislative Context

This section provides a description of the policy and legislative context within which the project is being proposed. The table indicates what legislation is applicable to the proposed project and how it has been complied with as discussed in Table 6-1.

Table 6-1: Policy and Legislative Context

Applicable legislation and guidelines used to compile the report	Reference where applied	How does this development comply with and respond to the policy and legislative context
<p>Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996)</p> <p>Section 24 of the Constitution states that everyone has the right to an environment that is not harmful to their health or well-being and to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures, that –</p> <ul style="list-style-type: none"> i. Prevent pollution and ecological degradation; ii. Promote conservation; and iii. Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development 	<p>A BA process has been undertaken to determine the impacts associated with the construction of the pipeline. As part of the BA process, mitigation measures and monitoring plans have been recommended to ensure that any potential impacts are managed to an acceptable level to support the rights as enshrined in the Constitution.</p>	<p>A BA application to construct the pipeline was submitted to the Mpumalanga Regional office of the DMR in Emalahleni on 16 February 2018 detailing the activities being undertaken as part of the Project. A BA Process has been undertaken which includes the compilation of a BA report where the impacts associated with the activities being undertaken have been determined (Part A: Section 12). The proposed measures in which to mitigate and manage the impacts are also detailed as part of this process (Part B: Section 5 and 6). A monitoring programme has also been compiled to ensure the project does not result in significant environmental damage during the construction, operation and decommissioning of the pipeline (Part B: Section 8).</p>
<p>National Environmental Management Act, 1998 (Act No. 107 of 1998)</p> <p>The NEMA, as amended was set in place in accordance with section 24 of the Constitution of the Republic of South Africa. Certain environmental principles under NEMA have to be adhered to, to inform decision making for issues affecting the environment. Section 24 (1)(a) and (b) of NEMA state that:</p> <p><i>The potential impact on the environment and socio-economic conditions of activities that require authorisation or permission by law and which may significantly affect the environment, must be considered, investigated and assessed prior to their implementation and reported to the organ of state charged by law with authorizing, permitting, or otherwise allowing the implementation of an activity.</i></p> <p>The EIA Regulations, Government Notice Regulation (GN) R.982 were published on 04 December 2014 and promulgated on 08 December 2014. These regulations have subsequently been amended in April 2017. Together with the EIA Regulations, the Minister also published GN R.983 (Listing Notice No. 1 which requires a basic assessment process), GN R.984 (Listing Notice No. 2 which requires an EIA process) and GN R.985 (Listing Notice No. 3 which requires a basic assessment process) in terms of sections 24(2) and 24D of the NEMA, as amended.</p>	<p>Environmental Authorisation (EA) and a Record of Decision (RoD) for all listed activities applied for in terms of the NEMA was granted by the Mpumalanga Department of Economic Development, Environment and Tourism (MDEDET) in August 2012.</p> <p>Environmental authorisation for the construction and operation of the pipeline is required for listed activities in terms of the EIA Regulations (2014) (as amended) of the NEMA. The listed activities are listed in Table 5-1. No activities identified in Listing Notice 2 apply to the proposed pipeline, and therefore a BA Process is being followed in applying for authorisation.</p>	<p>This BA report has been compiled in accordance with the requirements of the NEMA EIA Regulations, 2014 (as amended), with the environmental management objective to protect ecologically sensitive areas.</p>
<p>National Water Act, 1998 (Act No. 36 of 1998) (NWA)</p> <p>The NWA provides for the sustainable and equitable use and protection of water resources. It is founded on the principle that the National Government has overall responsibility for and authority over water resource management, including the equitable allocation and beneficial use of water in the public interest, and that a person can only be entitled to use water if the use is permissible under the NWA.</p> <p>GN R704 National Water Act, 1998 (Act No. 36 of 1998)</p> <p>Regulations 6 of the regulation on use of water for mining and related activities aimed at the protection of water resources, Government Notice Regulation 704 (GN R No. 704) published in June 1999.</p>	<p>Mbali Colliery is in possession of an Integrated Water Use Licence (IWUL) issued by the Department of Water Affairs (DWA) now the DWS on the 4th of June in 2012 (license no: 04/B11F/ACGIJ/1755).</p> <p>The Construction of infrastructure within 100 meters of a River or within 500 meters of a wetland requires a license under Section 40 of the NWA. The pipeline will be constructed across the Klippoortjiespruit therefore a WUL will be applied for in terms of Section 21 (c) and (i) in accordance with the NWA.</p>	<p>A WULA will be submitted to the DWS for the triggered water uses under Section 21 of the NWA. The WUL will be undertaken concurrently with this BA processes.</p>

Applicable legislation and guidelines used to compile the report	Reference where applied	How does this development comply with and respond to the policy and legislative context
<p><u>National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA)</u></p> <p>The National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA) is the overarching legislation that protects and regulates the management of heritage resources in South Africa. The Act requires that Heritage Resources be managed and conserved by a Resource Authority, either nationally, by the South African Heritage Resources Agency (SAHRA) or by the relevant provincial Agency. In this case, the Provincial Heritage Resources Authority Mpumalanga (PHRA-M) is responsible for the identification, conservation and management of heritage resources throughout the province.</p>	<p>A Heritage Basic Assessment Report (HBAR) was completed as part of the proposed project to determine the impact the pipeline may have on any heritage resources located in the area. The HBAR was submitted to the Mpumalanga Provincial Heritage Resources Authority (PHRA-M) and the South African Heritage Resources Authority (SAHRA).</p>	<p>No heritage/archaeological resources associated with the project site have been identified within the footprint of the pipeline. However the conservation of heritage resources has been considered as part of this project. A Heritage BAR has been compiled and has been submitted to SAHRA and the PHRA-M. The report has been attached as Appendix D.</p>
<p><u>Mineral and Petroleum Resource Development Act, 2002 (Act No. 28 of 2002)</u></p> <p>The MPRDA sets out the requirements relating to the development of the nation's mineral and petroleum resources. It also aims to ensure the promotion of economic and social development through exploration and mining related activities.</p> <p>In accordance with the 2014 EIA regulations(as amended) and one environmental management system, all environmental authorisations and EMPs that relate to any mining activity must be submitted to the DMR for consideration and authorisation.</p>	<p>The Mbali Colliery Mining Right (Reference No. MP 30/5/1/2/2 228 MR) was granted by the DMR in June 2008 and is valid until 25 June 2018. It is proposed that the mining right will be extended for another two additional years. The application for this extension will be submitted to the DMR prior to the expiration of the mining right. The proposed pipeline is directly related to the processing of a mineral resource and the DMR is therefore identified as the competent authority in respect to the application for Environmental Authorisation under NEMA.</p>	<p>A BA application to construct the pipeline was submitted to the Mpumalanga Regional office of the DMR in Emalahleni on 16 February 2018 detailing the activities being undertaken as part of the Project. A BA Process has been undertaken which includes the compilation of a BA report where the impacts associated with the activities being undertaken have been determined (Part A: Section 12). The proposed measures in which to mitigate and manage the impacts are also detailed as part of this process (Part B: Section 5 and 6). A monitoring programme has also been compiled to ensure the project does not result in significant environmental damage during the construction, operation and decommissioning of the pipeline (Part B: Section 8).</p>
<p><u>National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEM:BA)</u></p> <p>NEM:BA regulates the management and conservation of the biodiversity of South Africa within the framework provided under NEMA. This Act also regulates to the protection of species and ecosystems that require national protection and also takes into account the management of alien and invasive species. This Act works in accordance to the framework set under NEMA. The following regulations which have been promulgated in terms of the NEM:BA are also of relevance:</p> <ul style="list-style-type: none"> ▪ Alien and Invasive Species Lists, 2014 published (GN R.599 in GG 37886 of 1 August 2014) ; ▪ National Environmental Management: Biodiversity Act, 2004: Threatened and Protected Species Regulations (GN R.152 in GG 29657 of 23 February 2007) and ▪ National list of Ecosystems Threatened and in need of Protection under Section 52(1) (a) of the Biodiversity Act (GG 34809, GN R.1002, 9 December 2011). 	<p>As part of this project, flora and wetlands have been investigated to determine the current status of the environment and to determine any potential ecological sensitivity to be avoided and/or mitigated. The study focused specifically on where the pipeline is proposed to be located.</p> <p>No applications have been submitted in terms of NEM:BA for the project as no protected species were identified along the pipeline route and therefore permits are not required to relocate them.</p>	<p>The flora and wetlands assessment details the area where the pipeline will be located and have determined the ecological importance of the area. The findings of the flora and wetlands assessments, in the form of the impacts and the proposed mitigation measures for the project are detailed in Part A: Section 12 and Part B: Section 5 and 6 of this report.</p> <p>A list of threatened species that may occur around the project area has been listed in Section 6.2 of the Flora and Wetland Specialist Study (Appendix E). The project is not anticipated to impact on any protected species. No protected species were identified during the site visit along the pipeline route.</p>
<p><u>National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)</u></p> <p>On 29 November 2013, the list of waste management activities published under GN R718 of 3 July 2009 (GN R718) was repealed and replaced with a new list of waste management activities under GN R921 of 29 November 2013. Included in the new list are activities listed under Category A, B and C. These activities include inter alia the following:</p> <ul style="list-style-type: none"> ▪ Category A describes waste management activities requiring a Basic Assessment process to be carried out in accordance with the EIA Regulations supporting an application for a waste management licence; ▪ Category B describes waste management activities requiring an EIA process to be conducted in accordance with the EIA Regulations supporting a waste management 	<p>The construction of the pipeline does not trigger any waste related activities therefore no waste management licence is required.</p> <p>General construction waste that will be generated by the pipeline construction is expected to be limited and will be disposed of by the construction contractor at a licensed facility.</p> <p>Hazardous waste associated with pipeline construction is equally anticipated to be limited in volume. Hazardous waste should be temporarily stored at the Mbali Colliery's</p>	<p>Waste management mitigation measures have been identified and will be implemented to ensure no impact to the environment occurs. All waste, both general and hazardous, will be managed in accordance with the NEM:WA and relevant waste regulations.</p> <p>HCI Coal's internal waste management procedure will also be applicable to all waste generated as a result of pipeline construction.</p>

Applicable legislation and guidelines used to compile the report	Reference where applied	How does this development comply with and respond to the policy and legislative context
<p>licence application; and</p> <ul style="list-style-type: none"> Category C describes waste management activities that do not require a WML but these activities will have to comply with the prescribed requirements and standards as prescribed by the Minister, which includes the Norms and Standards for Storage of Waste, 2013. These activities include the storage of general waste at a facility with a capacity to store in excess of 100 m³ and storage of hazardous waste in excess of 80 m³. <p>The Waste Classification and Management Regulations published under GN R 634 of November 2013 require that all wastes be classified according to SANS10234 and managed according to its classification. The National Norms and Standards for the Assessment of Waste for Landfill Disposal were published under GN R635 on 23 August 2013 and prescribe the requirements for the assessment of waste prior to disposal to landfill in terms of Regulation 8(1)(a) of the Waste Classification and Management Regulations.</p> <p>The National Norms and Standards for the Disposal of Waste to Landfill were published under GN R 636 of 23 August 2013 and determine the requirements for the disposal of waste to landfill as contemplated in Regulation 8(1)(b) and (c) of the Waste Classification and Management Regulations.</p>	<p>existing hazardous waste bins and disposed of in the course of Mballi's normal waste disposal procedures (by a licensed contractor at a licensed facility)</p>	
<p><u>National Environmental Management: Protected Areas Act, 2003 (Act. 57 of 2003)</u></p> <p>The act aims to provide protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes; for the establishment of a national register of all national, provincial and local protected areas; for the management of those areas in accordance with national norms and standards; for intergovernmental co-operation and public consultation in matters concerning protected areas.</p>	<p>Officially protected areas, either Provincially or Nationally that occur close to a project site could be impacted by the Project.</p>	<p>A flora and wetland assessment has been undertaken to determine whether any protected areas are located within the project site. It has been determined that the pipeline does not fall within a protected area. The nearest protected area is 13 km to the north east of the pipeline called "John Cairns Private Nature Reserve".</p>
<p><u>Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983) (CARA)</u></p> <p>CARA aims to provide for the conservation of the natural agricultural resources of the country through the maintenance of the production potential of land, by combatting and preventing erosion and the weakening of water sources. In addition, this Act aims to protect vegetation, while combatting weeds and invader plants</p>	<p>Mitigation measures have been included for the potential impacts on soils and land capability. The mitigation measures are in compliance with the CARA, as referred to in Part B, Section 5 and 6.</p>	<p>Section 12 of the CARA details the maintenance of soil conservation in which every land user will be responsible for the maintenance and conservation of soil. The mitigation measures recommended as part of this BAR aim to prevent the compaction, erosion and degradation of the soil resources. Additionally where the pipeline is proposed to be constructed is dominated by invasive species. Therefore an invasive species management plan is proposed to be developed and implement to mitigate against the spread of these invasive species.</p> <p>The project will not result in the loss of agricultural land.</p>
<p><u>National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) (NEM:AQA)</u></p> <p>According to the NEM:AQA the Department of Environmental Affairs (DEA), the provincial environmental departments and local authorities (district and local municipalities) are separately and jointly responsible for the implementation and enforcement of various aspects of NEM:AQA. A fundamental aspect of the new approach to the air quality regulation, as reflected in the NEM:AQA is the establishment of National Ambient Air Quality Standards (NAAQS) (GN R 1210 of 2009). These standards provide the goals for air quality management plans and also provide the benchmark by which the effectiveness of these management plans is measured.</p>	<p>Air Quality has been considered for the Project. The activities proposed to take place do not trigger any air quality activities and therefore no Air Emissions License will be applied for.</p>	<p>The mitigation and management measures to be implemented as part of the project aim to manage and prevent potential impacts to air quality.</p> <p>Dust suppression will be implemented during the construction phase as necessary. In the operational phase the pipeline is not expected to contribute to generation of dust or any other emissions.</p> <p>The existing Mballi dust monitoring network will be used to ensure dust levels to not exceed allowable limits.</p>

7 Need and Desirability of the proposed Activities

The need and desirability of the proposed project has been considered at an economic, social and environmental level which has been discussed below.

7.1 Economic Consideration

South African economic growth is historically largely focused on the mining sector with specific reference on coal mining which has allowed the economy to be one of the strongest in Africa. Coal provides a total of 6.1 % of the country's total merchandise exports. South Africa holds a total of 31 billion tonnes of recoverable coal reserves which is equivalent to 11 % of the world's total coal reserve. This places South Africa as the sixth largest holder of coal in the world. A total of 77 % of the coal mined within South Africa is utilised within the energy sector, however 69 million tonnes of coal is exported per annum to various countries (Universal Coal, 2016).

The economic benefits associated with the construction and operation of the pipeline includes the continuation of the Mbali Colliery Wash Plant. The Mbali Colliery supplies coal to Eskom which assists with economic growth and development. The mine operates as an open cast operation and utilises a wash plant to wash the coal. As the colliery is currently experiencing water shortages this wash plant can no longer operate optimally due to the limited water available within the pits and PCD. The proposed construction and operation of the pipeline between TWRP and Mbali Colliery will assist in providing water to the coal wash plant. This will ensure the continuation of the mining operation in its current state.

Once Mbali Colliery reaches LoM it will lead to a downgrade of the economic wealth, jobs and tax revenue within the local community from the mining operation. It is therefore proposed that once Mbali Colliery is decommissioned, HCI Coal will source coal from other operations and process coal in the existing plant at Mbali. Therefore the pipeline and coal wash plant will remain in operation even after the mine ceases mining and is rehabilitated. This will assist in lessening the impacts associated with the decommissioning of the Mbali Colliery.

7.2 Social Consideration

The Mbali Colliery falls within the Emalahleni Local Municipality in the Nkangala District Municipality. Within the district municipality, mining is a significant contributor to the Gross Value Added by Region (GVA-R), contributing 40.8% in 2015 (Nkangala District Municipality, 2017). Mining is a significant industry within the Emalahleni Local Municipality, contributing almost 60% to the Gross Value Add (GVA) within Nkangala District Municipality.

Unemployment within the Nkangala District Municipality remains a challenge. As of 2011, 42.8% of the total population within the municipality was recorded as unemployed and a further 11.9% were recorded as being "discouraged work seekers" (Nkangala District

Municipality, 2017). Table 7-1 below summarises the statistics for the Emalahleni Local Municipality.

Table 7-1: Summary of employment statistics for ELM (adapted from Statistics South Africa, 2011).

Population (2011)	Emalahleni Local Municipality	
	Total number	Percentage of Total
Total population	395 466	-
Working age (15-64)	281 572	71.2%
Reported unemployment rate	-	27.3%
Employed	138 548	49.2%
Unemployed	52 114	18.5%
Discouraged work seeker	9 612	3.4%
Economically not active	81 494	28.9%

Unemployment is especially problematic within the working or economically active youth (i.e. members of the population aged between 15 and 34 years). Economic development and job creation are therefore major themes in the Integrated Development Plan (IDP) of Nkangala District Municipality. To this end, the aims and objectives of the IDP include skills development and skills transfer in a number of outreach exercises to empower the youth and provide opportunities for employment.

Once Mbali Colliery reaches LoM it will lead to a loss of jobs created by decommissioning and closure of the mine and could potentially result in an increased unemployment rate within the local municipality. The pipeline proposed by Mbali Colliery is not expected to increase the LoM. However, the operation of the pipeline will extend beyond the LoM as Mbali proposes to source coal from other mines in the region and incorporate this into their current coal wash plant.

Mbali Colliery currently provides the local market with a total of 89 direct job opportunities. Of this a total of 41 Employees are in the Engineering Department, 27 employees are employed as office staff and 21 employees are directly involved in the operation of the coal wash plant. The construction and operation of the pipeline to supply water to the coal wash plant and ensure its continued operation will ensure the prevention of job losses associated with plant decommissioning. In addition to the employment provided by Mbali Coal Directly, their mining contractor, Diesel Power, employs 178 people.

Mbali Colliery would also be able to continue contributing to the GVA of the Emalahleni Local Municipality and the GVA-R of the Nkangala District Municipality.

Mbali Colliery currently sells coal for the metallurgy and electricity-producing industries. Eskom specifically obtains coal from Mbali to generate power for the national grid. The National Development Plan has included electricity security as a milestone and aims to “Produce sufficient energy to support industry at competitive prices, ensuring access for poor households, while reducing carbon emissions per unit of power by about one-third” by 2030 (National Planning Commission, 2012). Mbali Colliery would therefore be able to reliably continue its contribution to the national electricity supply through the construction and operation of this pipeline.

It should also be considered that during the construction phase it is anticipated that 8 jobs will be created over a period of four months which will have a short term positive impact on the social environment. No jobs are however anticipated to be created once the pipeline becomes operational as the operation of the pipeline is not labour intensive.

7.3 Ecological Consideration

Based on the impact assessment that was undertaken for the proposed construction and operation of the pipeline (See Section 12 - 15), no significant negative environmental impacts are expected, assuming the prescribed mitigation and management measures are implemented.

The proposed pipeline will not be associated with unmanageable ecological risk, and will be associated with improved and continued operations of the Mbali coal wash plant.

Therefore the proposed development can be supported from an environmental perspective.

The environmental impacts are associated with the construction of the pipeline. The pipeline will not result in any significant negative impacts to the ecological environment however no positive impacts on the ecological environment were identified. The pipeline is proposed to be located within a heavily mining associated area. The cumulative impacts from the pipeline are considered to be negligible in comparison to the impacts associated with mining activities. The pipeline is proposed to be constructed over the Klippoortjiespruit therefore there is a possibility that the impact to the surface water resource may occur. However, with appropriate mitigation measures to be implemented this negative impact would be considered to be low. The vegetation to be cleared has already been transformed and it is not anticipated that any other impact associated with the pipeline will negatively affect the environment.

The total amount of water being discharged to the environment from the TWRP is 12,960,000m² per annum (according to the TWRP Water Use License). Therefore, the loss in this water being discharged to the environment due to the construction of the proposed pipeline will not have a significant impact on the environment as the contribution to the water resources was limited.

8 Motivation for the overall preferred Site, Activities and Technology Alternative

As discussed in Section 9, various alternatives to the proposed pipeline have been investigated to ensure the most suitable and preferable alternatives are selected to ensure the least number of impacts on the environment occur, and that those impacts that are unavoidable are managed to an acceptable level of significance. The motivation for the preferred alternatives has been discussed below:

8.1 Preferred Pipeline Route Alternative

Various route alternatives were investigated during the pre-application process. Only two routes as discussed below and shown in Plan 4 in Appendix B were investigated further due to the reduced impacts on the environment.

Route A, has been selected as the preferred route. Route A is the shortest route and associated with the least vegetation clearance. The route has also been selected as it crosses the least number of roads compared to Route B. The pipeline is proposed to be located within the road reserve as this area has already been impacted upon. The pipeline route has been selected to ensure that only one river (the Klippoortjiespruit) is crossed which is unavoidable.

8.2 Preferred Water Source Alternative

The proposed pipeline to transport water from the TWRP to the Mbali Colliery is considered to be the preferred alternative and the only alternative which has been investigated in detail in this report.

The alternative has been selected as the route is considered to be the shortest. Alternative mines which could provide Mbali with water are further away resulting in increased pipeline length and associated impacts.

Additionally the financial cost in constructing the pipeline is considered to be more feasible for the construction of a shorter route than a longer route. The water that is proposed to be utilised has already been impacted from mining. Abstracting water from groundwater or surface water sources would increase the impact on the water regime in the area which would previously not be impacted. Additionally the water sources in this area are considered to be limited and therefore abstraction from natural sources is not considered a feasible option.

8.3 Preferred Design Alternative

It is proposed that the pipeline will be constructed above ground at the connection point to the TWRP, from where it will be underground up to the connection point with the Mbali Mine. The pipeline will also daylight at the crossing with the Klippoortjiespruit and be attached to the existing bridge at this section. This option will prevent the pipeline from being stolen

(which would result in economic losses to HCI Coal, and in the sudden discharge of potentially contaminated water to the environment).

9 Full Description of the Process Followed to reach the Proposed Preferred Alternatives within the Site

9.1 Details of the Development Footprint Alternatives Considered

Alternatives are different means of meeting the general purpose and need of a proposed activity. Alternatives aid in identifying the most appropriate method of developing the project, taking into account location or site alternatives, rehabilitation alternatives, as well as the no-project alternative. Alternatives also aid in determining the activity with the least environmental impact.

The potential alternatives that have been identified to date are provided below. .

9.1.1 Location Alternative

Plan 4 illustrates the two alternative routes which have been investigated to determine which route is the preferred route alternative. Route A is proposed to be constructed on the eastern side of the road within the road reserve going towards Mbali Colliery. Route A will have to cross three different roads including the R545 whereas Route B will have to cross four different roads from the TWRP to the Mbali Colliery. Route A has therefore been selected as the most preferable route.

9.1.2 Water Source Alternative (Technology)

Four different alternative water sources can be selected to obtain water for the operation of the wash plant at the Mbali Colliery.

9.1.2.1 Water Sourced from Mines in the Area

A number of mines are located around the Mbali Colliery which has surplus water which Mbali Colliery could utilise at their coal wash plant. It was determined that the most favourable mine to source water from was the TWRP, as it is the closest (by road) facility to Mbali Colliery, and enables the pipeline construction within the road reserve.

It was found that should an alternative mine be selected within the area the pipeline would need to be at a minimum 5 km in length which has both an increased environmental impact and financial implications. The pipeline would need to be constructed over more natural vegetation as it would not be located within the road reserve and would have to cross multiple water resources which would increase the impact associated with the pipeline construction.

Additionally, Mbali Colliery has already initiated negotiations with Glencore, who have agreed (in principle and subject to conditions) to supply HCI Coal with water from the TWRP.

Should an alternative mine be selected, further water negotiations with said mine would need to take place.

9.1.2.2 Water Trucked to the Operation

A technology alternative which has been considered includes trucking of water into the Mbali Colliery. This alternative was disregarded as it is not considered a sustainable solution for increased numbers of trucks to continuously operate. Additionally the water would need to be sourced from an alternative water resource which could not be determined. The operation of the trucks would be extremely cost intensive as opposed to a pipeline which once constructed will be more affordable from an operation and maintenance perspective. Costs will mainly be incurred from electricity needed to operate the pumps at the TWRP.

9.1.2.3 Groundwater / Surface Water Alternatives

An alternative water source could be obtained from either ground- or surface water. Mbali Colliery could drill an additional borehole and pump water from the groundwater resource to the coal wash plant. This is not considered to be a suitable option as the groundwater has a very low yield capacity near Mbali. Water could also be sourced from a fresh water resource (Klippoortjiespruit or the tributary flowing through the Mbali Mining Right Area) which will be pumped via pipeline to the mining operation. The two options proposed are not considered to be favourable options as Mbali would be utilising an additional natural water resource to wash coal at the wash plant while a dirty water resource alternative is available.

9.1.3 Design Alternative

Two design alternative have been investigated which include the construction of the pipeline below ground except where it daylights at the Klippoortjiespruit river crossing (Option A) or the construction of the pipeline above ground (Option B).

Option A: If the pipeline is constructed below ground it makes it more difficult to visually identify if the pipeline is leaking. However, installation of flow meters on either end of the pipeline will serve as a more accurate leak detection system than visual inspection. If the pipeline is constructed underground it reduces the visual impact on the environment and prevents the possibility of theft of the pipeline which is a serious concern as crime in the area is extremely high.

Option B: The construction option will allow for easy visual leak detection. However, the pipeline may regularly be affected by criminal activity which could pose a significant risk to the environment as spillages may occur if the pipeline is stolen and water is still being pumped between the two mines.

Option A and B are both associated with excavations (trenches for Option A and foundation for Option B).

Due to the significant risk of crime in the area it is determined that Option A is the preferred option as it will prevent significant risk of the pipeline being stolen and prevent accidental

spillages to the environment. Through mitigation measures proposed in Section 5 and 6, the pipeline disturbance and possible leaks can be reduced.

9.1.4 No Go Option

Should a No Go option be selected the pipeline will not be constructed therefore all negative and positive impacts associated with the pipeline will not be realised. Additionally it should also be considered that if the pipeline is not constructed the following could occur:

- **Effect 1:** The coal wash plant at Mbali Colliery will be closed and decommissioned. The coal extracted at Mbali will then be sent to other mines where it can be washed and sold. This requires an additional third party in the mining process which is not favourable. The mines profitability will be reduced as Mbali will need to pay an alternative mine to wash the coal; or
- **Effect 2:** The Mbali Colliery closes before LoM is reached as it may not be profitable to extract the coal and then pay another mine to wash the coal before it is sold. This will mean that the coal resource may not be fully realised.

The two scenarios provided will result in a loss of jobs, revenue streams and tax revenue before the mine reaches LoM. The closure of the wash plant (Effect 1) will result in a loss of jobs to all those individuals who are involved in the operation of the plant while if Effect 2 occurs all individuals employed by Mbali will lose their jobs before LoM is reached.

10 Details of the Public Participation Process followed

A Public Participation Process (PPP) is a statutory requirement in terms of the NEMA. The main objective of PPP is to provide a platform for the applicant, Interested and Affected Parties (I&APs) and relevant organs of state to work together to enable the relevant authorities to make an informed decision on the proposed project. Through the PPP, I&APs are able to contribute local knowledge and raise comments applicable to the project planning and design.

The Public Participation Process (PPP) consists of three phases, namely:

- Formal project announcement;
- Public comment period for the draft BAR; and
- Announcement of the Decision (granting or not granting of the Environmental Authorisation by the DMR).

The activities undertaken during each phase are described below. This is the Draft BAR and no comments have been received from I&APs as yet. All comments received from I&APs will be recorded in the Comment and Response Report (CRR). In addition, copies of the Background Information Letter (BIL) with Registration and Comment Form, sites notice and newspaper advertisements are included in Appendix C.

10.1 Formal Project Announcement

As part of the announcement phase, details of the proposed project together with availability of the Draft BAR were provided to stakeholders. Below are the key activities undertaken for the PPP Announcement Phase.

10.1.1 Identification of Stakeholders

Stakeholders interested in or affected by the proposed project were identified by means of the methods indicated below:

- Conducting Windeed and related desktop searches in and around the project area to verify land ownership and occupancy and obtain landowner contact details;
- Use of HCI Coal and Mbali Colliery's existing stakeholder databases;
- Responses on the distribution of the BIL, site notices or newspaper advertisement placed; and
- Telephonic consultations with landowners to identify additional I&APs

Stakeholders for the proposed project were grouped into the following categories:

- **Government:** National, Provincial, District and Local authorities;
- **Landowners and occupants:** Directly affected, adjacent or indirectly affected landowners and occupants;
- **Parastatals:** Such as Transnet and SANRAL;
- **Non-Governmental Organisations (NGOs):** Environmental and social organisations; and
- **Business:** Small and medium enterprises, mining and industrial companies.

A stakeholder database was compiled and has been updated throughout the environmental regulatory process (see Appendix C).

10.1.2 Public Participation Media

Considering the legislative requirements and good practice, the following methods have been implemented to make project information available to stakeholders.

- **Background Information Document:** a BID which included a project description, information about the relevant legislation, the competent authorities and details of the appointed EAP was prepared. The BID was also accompanied by a Registration and Comment Form for stakeholders to use for formal registration as I&APs or to submit comments. Information regarding the availability of the Draft BAR was also provided, and I&APs were asked to comment.
- **Newspaper advertisement:** a newspaper advertisement was placed in the Emalahleni News which is a local newspaper that distributes to Emalahleni and

surrounding areas (including Ogies and the area where Mbali Colliery is located). The advert was published in English and included a brief project description, information about the relevant legislation, the competent authorities, details of the appointed EAP, registration process for I&APs, and information regarding the availability of the Draft BAR for public comment.

- **Site notices:** Site notices were put up at various places. The site notices contained a brief project description, information about the relevant legislation, the competent authorities and details of the EAP, registration process for I&APs and information regarding the availability of the Draft BAR for public comment. Plan 16 in Appendix C shows the locations for the site notices.

The BAR has been made available for a public comment period of 30 days from 23rd February 2018 to 26th March 2018 at the Ogies Public Library and on the Digby Wells website: www.digbywells.com (under Public Documents). Once the commenting period is reached the Draft BAR will be updated and submitted to the DMR for consideration. Simultaneously, the updated BAR will be made available to I&APs on the Digby Wells website and I&APs will be informed of such by means of a letter (email and post). This enables I&APs to verify that their comments have been captured and responded to.

10.1.3 Public Participation Activities undertaken

Table 10-1 below provides a summary of the PPP activities undertaken thus far, together with referencing materials included as annexures in Appendix C.

Table 10-1: Public Participation Activities

Activity	Details	Reference in Report
Identification of stakeholders	Stakeholder database was developed which represents various sectors of society, including directly affected and adjacent landowners, in and around the proposed project area.	Appendix C1: Stakeholder Database
Distribution of BID	A BID with registration and comment form was emailed and posted to stakeholders on 22 February 2018. An SMS was also sent to stakeholders on 22 February 2018 announcing the availability of the BAR.	Appendix C2: BID, letter with registration and comment sheet
Placing of newspaper advertisement	A newspaper advertisement was placed in the Emalaheni News on 22 February 2018.	Appendix C3: Advertisement
Putting up of site notices	Site notices were put up at the proposed project site, Ogies library, Mbali Colliery and at the GGV mine on 22 February 2018.	Appendix C4: Site Notice

Activity	Details	Reference in Report
Announcement of the Draft BAR availability	Announcement of availability of the Draft BAR was emailed and posted to stakeholders together with the formal project announcement on 22 February 2018. Copies of the Draft BAR were available to stakeholders at Ogies Public Library. The Draft BAR is available on the Digby Wells website: www.digbywells.com (under Public Documents). <i>(The comment period for the Draft BAR is from 23rd February 2018 to 26th March 2018)</i>	Appendix C2:: BID Appendix C3: Advert Appendix C4: Site Notice
Obtained comments from stakeholders	Comments, issues of concern and suggestions received from stakeholders will be captured in the CRR once received.	To be included in the Final BAR

10.1 Decision-Making

Once the competent authority has taken a decision regarding the proposed project, results thereof, together with information about the regulated appeals procedure, will be communicated to stakeholders as prescribed under the NEMA legislation. Notification to stakeholders will be done by means of a letter via email and post.

10.2 Summary of Issues Raised by I&APs

No comments have been received to date for the proposed pipeline. Once comments are received this will be included in the BAR and within in Appendix C5: Comment and Response Report.

11 The Environmental Attributes associated with the Alternatives

A summary of the baseline environment in the proposed project area is provided in the sections below. It should be noted that the flowing specialist studies have been undertaken for the proposed project:

- Heritage Specialist Assessment (Appendix D); and
- Flora and Wetland Specialist Assessment (Appendix E).

Additional information has been sourced from previous specialist studies undertaken for Mbali Colliery and in the surrounding areas.

11.1 Climate

The Mbali area has a typical Highveld climate with dry cold winters and warm summers with thunderstorms. Frost and hail occurs frequently during winter and summer respectively.

11.1.1 Rainfall and Precipitation

Historic rainfall data for the area indicates that rainfall, on average, totals about 750 mm per annum. The rainfall season generally starts in September and lasts until April. On average, monthly rainfall in excess of 150 mm can be expected from middle of October to middle of March. Extreme events can occur with rainfall up to 300 mm being recorded in November and January. The highest rainfall recorded was in the year 2000, with almost 1000 mm. The lowest annual rainfall was recorded in 2003, with less than 400 mm.

11.1.2 Temperatures

The lowest temperatures for both maximum and minimum ranges are recorded in June and July. This is expected as these months are the winter months. The highest temperatures are recorded in December, January and February which is characteristic of the summer period.

11.1.3 Wind Direction and Speed

The winter months in the Highveld are characterised by calm, stable and dry conditions which are conducive to the formation of temperature inversions. Winds are generally light, with strong gusty westerly winds associated with the passage of weather disturbances. The prevailing winds, however, predominate from the north west, north east and east during summer and from the north west and south west in winter.

11.2 Groundwater

The groundwater systems in the Mpumalanga coalfields are composed of three distinct superimposed aquifers. They are the upper weathered Ecca aquifer, the fractured aquifers within the unweathered Ecca sediments and the aquifer below the Ecca sediments. The following aquifer description extracted from Hodgson et al. (1998) is relevant to the project area as shown in Table 11-1.

Table 11-1: Aquifer description extracted from Hodgson et al. (1998) for the project area

Type of Aquifer	Description
The Weathered Aquifer	<ul style="list-style-type: none"> ▪ The Ecca sediments are weathered to depths between 5 and 12 m below surface throughout the area; ▪ This aquifer is recharged by rainfall. The percentage recharge to this aquifer is estimated to be in the order of 1% to 3% of the annual rainfall (Kirchner et al. (1991) and Bredenkamp (1995); and ▪ Highly variable recharge values can be found from one area to the next due to attributes composition of the weathered sediments.

Type of Aquifer	Description
Fractured Ecca Aquifer	<ul style="list-style-type: none"> ▪ The pores within the Ecca sediments are well-cemented and do not allow any significant flow of water; and ▪ All groundwater movement therefore occurs along secondary structures, such as fractures and joints in the sediments.
Coal Seam Aquifer	<ul style="list-style-type: none"> ▪ Hodgson et al. (1998) states that of all the unweathered sediments in the Ecca, the coal seams often have the highest hydraulic conductivity. The permeability of the coal seam aquifer is in the order of 0.1 meters per day (m/d).

11.2.1 Groundwater Quality

Groundwater quality monitoring results at the Mbali Colliery is presented below in Table 11-2.

Table 11-2: Groundwater Results between July and September 2017

Site Name	Date Measured	pH	EC (mS/m)	TDS mg/L	Cl (mg/L)	NO ₃ mg/L	SO ₄ mg/L	Ca mg/L	Na mg/L	Mg mg/L	F mg/L	K mg/L
WUL – Surface Water Quality Objectives		6.5 – 9.0	70	500	25	6	300	130	70	70	1	50
Anton BH	28/09/2017	9.04	65.00	362.00	78.90	<0.1	4.32	2.85	141.00	0.78	17.90	0.85
Anton BH	17/08/2017	8.78	64.20	342.00	82.00	<0.1	4.23	2.85	145.00	0.71	19.70	0.88
BH10	28/09/2017	7.19	17.00	110.00	15.90	0.91	3.29	14.50	14.20	4.05	<0.2	3.24
BH10	17/08/2017	7.42	18.40	124.00	16.10	0.77	9.72	15.90	16.50	4.18	<0.2	3.32
BH11	17/08/2017	8.12	39.20	296.00	5.88	<0.1	2.60	20.60	63.10	10.40	1.47	5.43
BH2A	28/09/2017	7.71	43.20	284.00	11.40	<0.1	21.20	40.30	31.00	15.90	1.62	5.27
BH2A	19/07/2017	7.79	42.40	278.00	9.54	<0.1	9.31	41.00	29.50	16.70	1.35	5.46
BH3	17/08/2017	7.01	13.60	88.00	5.40	1.40	7.86	8.33	12.40	3.43	<0.2	3.05
BH3	28/09/2017	6.86	12.60	90.00	7.00	1.08	5.84	8.99	13.90	3.41	<0.2	3.26
BH4	17/08/2017	7.35	26.10	148.00	5.55	<0.1	7.84	20.60	23.90	6.70	0.23	3.11
BH4	28/09/2017	7.21	25.50	168.00	5.96	<0.1	9.95	23.10	23.80	7.81	0.20	3.31
BH4	19/07/2017	7.22	25.30	156.00	6.22	<0.1	7.72	18.80	24.00	7.79	<0.2	3.44
BH5	17/08/2017	7.34	14.80	96.00	6.29	0.37	5.76	9.72	15.40	4.12	0.21	2.11
BH5	19/07/2017	7.10	8.06	56.00	9.77	0.83	5.18	3.76	11.40	1.95	<0.2	2.28
BH5	28/09/2017	6.98	11.50	76.00	5.28	0.17	4.27	6.93	15.90	3.21	<0.2	2.82
BH7	28/09/2017	5.62	27.80	152.00	70.40	0.28	3.02	7.37	37.10	4.70	<0.2	4.53
BH7	17/08/2017	6.08	27.70	172.00	68.20	0.42	2.40	8.41	37.40	5.85	<0.2	5.73
HCBH15	17/08/2017	7.60	24.22	122.00	17.30	<0.1	19.00	11.90	17.70	7.91	<0.2	3.82
Industrial BH	28/09/2017	8.55	53.20	332.00	29.80	<0.1	2.87	3.86	123.00	1.08	11.00	0.73
Industrial BH	17/08/2017	8.61	52.90	304.00	28.80	<0.1	3.46	4.35	128.00	0.91	11.10	0.74
Old House BH	17/08/2017	6.79	39.30	236.00	42.20	1.82	86.80	13.90	37.40	12.60	<0.2	11.90
Old House BH	28/09/2017	6.16	39.30	254.00	43.90	1.66	90.30	14.30	36.80	12.20	<0.2	12.40
PIT	17/08/2017	7.88	21.30	130.00	13.10	<0.1	32.00	15.90	17.80	6.39	0.27	4.35
Pit	28/09/2017	8.22	40.40	278.00	9.42	9.66	46.10	41.90	20.00	12.60	<0.2	6.29
Pit	19/07/2017	8.07	256.00	2276.00	8.83	3.58	1430.00	331.00	111.00	141.00	0.35	10.60
Safika Oosthuizen	28/09/2017	7.28	25.30	142.00	16.50	<0.1	11.90	15.30	19.20	9.18	<0.2	3.91

Note: Values in red cells indicate exceedances of the stipulated water qualities indicated in the approved WUL for Mbali Colliery.

11.2.2 Groundwater Levels

The elevation of the groundwater above the mean sea level is shown in Figure 11-1, while the depth of the water level below ground surface is shown in Figure 11-2.

The water level appears to have reached a steady state and no impact on the water level due to mine dewatering at Mbali Colliery is evident since January 2016. However, the data is available only from January 2016 and is not sufficient to evaluate the effect of mine dewatering on the cone of depression and radius of influence.

The water level depth ranges between 2.71 m (BH1) and 24.8 m (BH2A); while the hydraulic head varies between 1537 m above mean sea level (BH2A) and 1583 m (BH1). This is an indication that the hydraulic head is higher in the east and lower in the west. The groundwater flow direction is therefore from east to the west.

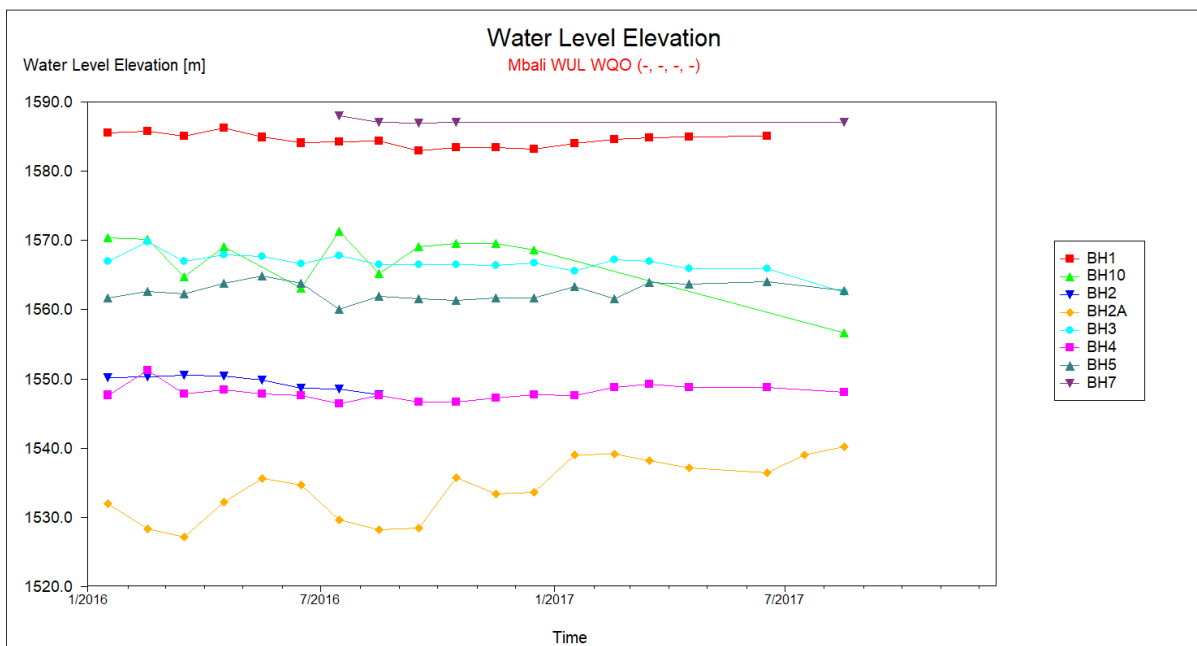


Figure 11-1: Groundwater Elevation Trend

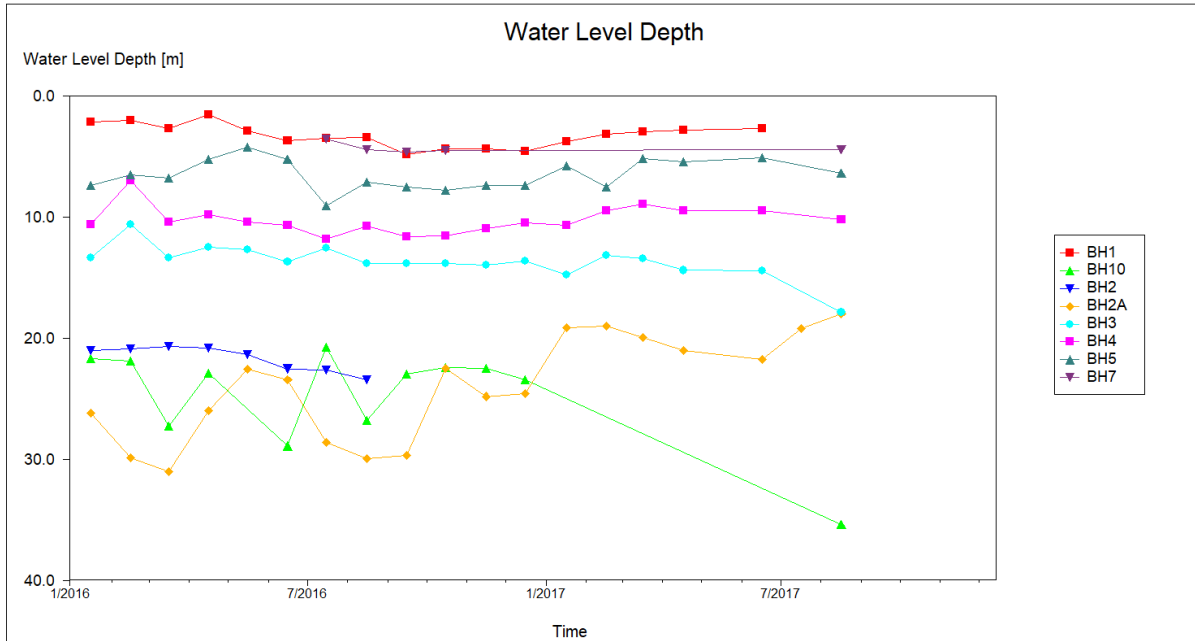


Figure 11-2: Depth of the Water Level

11.3 Surface Water

The proposed pipeline falls in the Upper Olifants Water Management Area (WMA) which is WMA 04, within the B11F quaternary catchment. The main system which is found in this catchment is the Klippoortjiespruit. The mean annual run-off (MAR) for the quaternary catchment B11F within which the project area lies is 14.7 million m³ for an overall catchment size of 428km². There is an unnamed stream which flows through the western portion of the Mbali Colliery that eventually joins the Klippoortjiespruit at approximately 2.5 km north of the site. The Klippoortjiespruit flows from west to north of the Mbali Colliery and is 1.5 km away at its closest distance. The proposed pipeline is required to cross the Klippoortjiespruit

Water in the area is generally utilised for mining activities and livestock watering. Downstream of the site are numerous and varied users such as aquatic life, livestock watering, domestic abstraction and industrial use associated with the Olifants river.

Surface water quality results for the tributary of the Klippoortjiespruit which runs through the Mbali Colliery is presented below in Table 11-3.

Table 11-3: Surface Water Quality Results between July and September 2017

Site Name	Date Measured	pH	EC (mS/m)	TDS mg/L	Cl (mg/L)	NO ₃ mg/L	SO ₄ mg/L	Ca mg/L	Na mg/L	Mg mg/L	F mg/L	K mg/L
WUL – Surface Water Quality Objectives		6.5 – 9.0	70	500	25	6	300	130	70	70	1	50
MSW1	19/07/2017	7.73	143.00	996.00	26.70	1.08	680.00	150.00	64.60	63.70	0.55	11.30
MSW1	17/08/2017	7.93	160.00	1296.00	32.10	1.80	780.00	179.00	74.40	68.00	0.70	11.80
MSW1	28/09/2017	7.80	187.00	1522.00	40.20	<0.1	941.00	212.00	102.00	91.70	1.00	15.20
MSW2	28/09/2017	6.78	101.00	722.00	33.10	0.20	250.00	82.80	91.20	34.80	0.67	4.08
MSW2	17/08/2017	7.89	150.00	1108.00	50.80	6.42	593.00	148.00	94.80	60.90	0.73	10.40
MSW2	19/07/2017	7.49	228.00	1890.00	18.60	11.70	1238.00	282.00	89.60	116.00	0.47	15.10
MSW3	19/07/2017	7.58	159.00	1202.00	23.70	1.45	797.00	168.00	73.10	74.30	0.62	9.04
MSW3	17/08/2017	7.61	168.00	1444.00	24.70	<0.1	866.00	198.00	92.90	92.10	0.77	9.79
MSW3	28/09/2017	7.28	160.00	1310.00	30.50	0.87	805.00	161.00	94.30	73.50	1.02	10.60
MSW4	19/07/2017	7.20	36.60	240.00	34.10	<0.1	30.80	15.70	55.50	7.89	0.45	8.10
MSW4	17/08/2017	7.65	64.90	388.00	40.00	<0.1	2.57	32.00	62.60	20.00	0.88	16.20

Note: Values in red cells indicate exceedances of the stipulated water qualities indicated in the approved WUL for Mbali Colliery.

The stream quality is within the recommended limits of 6.5 and 8.4 and thus there is no acid mine drainage concern at the site. However, the stream has low TDS up gradient of the mine site. It is noted that the stream has been impacted upon as it passes through the mine. This is confirmed by the increased TDS recorded at monitoring points below the mine. It is evident that the mine is contaminating the stream and mitigation measures (such as dirty stormwater management, road watering or coal dust control) should be enforced. Digby Wells is currently undertaking a study to determine the exact cause of the increased TDS so that targeted management action can be identified and implemented.

Sulphate is associated with mine drainage; and in the case of Mbali it is neutral mine drainage. Noteworthy is the background stream quality above the mine being less than 60 mg/L while the concentration at and downgradient of the mine has reached a maximum of 1200 mg/L. Historical or current activities at Mbali are likely the source of the stream contamination.

11.4 Aquatics

According to DWA (2013), the Present Ecological State (PES) of the Sub Quaternary Reach (SQR) is categorised as seriously modified, class E (Table 11-4). The overall deteriorated state of the catchment area can be attributed to a number of impoundments constructed along the watercourse which is compounded by the extensive loss of habitat, biota and basic ecosystem functions. According to the DWA (2013), impacts such as water abstraction, vegetation removal associated with agricultural lands and mining runoff has contributed to the low PES. A summary of the available desktop data is given in Table 11-4 below.

Table 11-4: Current status of the B11F-01286 sub quaternary reach according to available desktop information (DWA, 2013)

Sub-quaternary Catchment	B11F-01286
Present Ecological Status	Class E (Seriously modified)
Ecological Importance	Moderate
Ecological Sensitivity	High
Attainable ecological management class	Class B

The PES, according to DWA (2013), of the Klippoortjiespruit instream habitat was considered to be seriously impacted. This means that modification is frequently present and that the habitat quality, diversity, variability and size in almost the whole of the defined area are affected (only small areas are not affected). Furthermore, flow and physio-chemical conditions are considered to be seriously modified.

The Ecological Importance (EI) of the sub-quaternary reach was considered to be moderate (Table 11-4). The moderate EI was a result of the SQR being dominated by endangered

vegetation grassland units with wetland and riparian habitats. According to DWE (2013), 1 protected and 3 endemic species are likely to be found in this reach.

Invertebrate taxa species richness was considered high with a total of 41 species expected to be found in the SQR. However, this data was based predominantly on assumptions and desktop information. The expected number of fish species in the sub-quadernary reach is five (Table 11-5). However, three invasive species (bass, carp and mosquito fish) are also expected to be found in the reach.

The Ecological Sensitivity (ES) for the SQR is considered to be high. The sub-quadernary reach was categorised as highly sensitive due to the presence of sensitive invertebrate and fish species (e.g. *Barbus neefi*), with high specific preferences to flow and physio-chemical/water quality. Furthermore, the presence of instream vegetation with high intolerance of stream size variability and riparian-wetland vegetation sensitive to water level changes attributes to the high Ecological Sensitivity (DWA, 2013).

11.4.1 Expected Species

The expected fish species list for the B11F catchment area (Table 11-5) as well as the macroinvertebrate expected taxa list (Table 11-6) was generated according DWA (2013) desktop information. Sensitivity of the expected taxa of macroinvertebrates is considered to range from highly tolerance to very low tolerance to pollution.

Table 11-5: Expected fish species for the Klippoortjiespruit, catchment B11F (DWA, 2013)

Fish species	Common name	Status
<i>Enteromius neefi</i>	Side spotted Barb	Indigenous
<i>Enteromius anoplus</i>	Chubbyhead Barb	Indigenous
<i>Enteromius paludinosus</i>	Straightfin Barb	Indigenous
<i>Clarias gariepinus</i>	Sharptooth Catfish	Indigenous
<i>Pseudocrenilabrus philander</i>	Southern Mouthbrooder	Indigenous
<i>Tilapia sparrmani</i>	Banded Tilapia	Indigenous

Table 11-6: Expected macroinvertebrate taxa for the Klippoortjiespruit, catchment B11F (DWA, 2013)

Family names	Family names	Family names
Ancylidae	Heptageniidae	Trichorythidae
Baetidae	Hydroptilidae	Notonectidae
Caenidae	Coenagrionidae	Simuliidae

Family names	Family names	Family names
Ceraptopogonidae	Corduliidae	Sphaeriidae
Chironomidae	Gyrinidae	Leptophlebiidae
Corixidae	Hydracarina	Velliidae
Dytiscidae	Hydropsychidae	
Gomphidae	Oligochaeta	

11.5 Flora and Wetlands

The National Freshwater Ecosystem Priority Areas (NFEPA) provides information of wetland and river ecosystems for integrating into freshwater ecosystem and biodiversity planning and decision-making processes. The wetland types that dominate the landscape are Valley Floor wetlands. The NFEPA wetlands have been ranked in terms of importance in the conservation of biodiversity. The Project wetlands are mostly of Rank 2 (protected wetlands), 5 (Wetlands (excluding dams) within a sub-quaternary catchment) and 6 (Any other wetland (excluding dams)). Rank 2 wetlands are important wetlands that fall within 500 m of an IUCN threatened frog point locality or threatened water-bird point locality. Alternatively they fall mostly within a sub-quaternary catchment that has sightings or breeding areas for threatened Wattled Cranes, Grey Crowned Cranes and Blue Cranes or has been identified by experts at the regional review workshops as containing wetlands of exceptional Biodiversity importance, with valid reasons documented or as containing wetlands that are good, intact examples from which to choose. It is also noted that the Mining and Biodiversity Guideline (2013) identifies the area where the proposed pipeline will be constructed as 'Highest Risk for Mining'.

The Mpumalanga Biodiversity Sector Plan (MBSP) is a spatial tool that forms part of the national biodiversity planning. The proposed pipeline traverses only natural or modified areas. However, the natural areas were not pristine as they are subject to grazing and / or grass bailing, agriculture, mining, roads and powerlines.

11.5.1.1 Wetlands

Multiple wetland systems totalling 211.8 ha fall within the 500 m buffer of the proposed pipeline route. Four hydrogeomorphic (HGM) Units were identified within the 500m buffer area (the defined study area for the wetlands assessment) namely a large un-channelled valley bottom wetland that drains into a channelled valley bottom system, a seep and an isolated depression. The breakdown of the wetland types per area is detailed in Table 11-7 and illustrated in Plan 5 in Appendix B. A buffer zone of 100 m has been illustrated in accordance with Government Notice 704 (GN 704).

Table 11-7: Wetland HGM Units

HGM Unit	HGM Unit Type	Area (ha)
1	Un-channelled Valley Bottom	69.4
2	Depression	9.8
3	Channelled Valley Bottom	103.5
4	Seep	29.2

A description for each HGM Units which was identified within the study area is included in Table 11-12.

11.5.1.2 Flora

The Project area occurs in the Eastern Highveld Grassland regional vegetation type (Mucina and Rutherford, 2012). It is an endangered vegetation type with a conservation target of 24%.

The majority of the study area had undergone transformation due to cultivation for maize and soy beans as well as mining activities and road construction which resulted in historical disturbance of floral components and soil compaction in some areas. Livestock were also observed throughout most of the site and evidence of overgrazing was recorded in grassland areas.

A total of 42 plant species were recorded within the proposed project area. The natural areas associated with the project area are discussed below. The disturbed grassland, cultivated areas and alien bushclumps have also been discussed. The primary land uses and vegetation habitats identified in the vicinity of the proposed pipeline route are listed in Table 11-8 and illustrated in Plan 6 in Appendix B.

Table 11-8: Vegetation Habitats (and other land use) and Approximate Areas

Vegetation Unit	Area (ha)	Proportion of total project area (%)
Depression	4.57	1.05%
Valley bottom wetlands	106.70	24.46%
Infrastructure	57.30	13.14%
Disturbed Grassland / mowed servitude	44.43	10.19%
Alien bushclumps	2.83	0.65%
Cultivation (maize and soybean)	213.81	49.02%
Total	429.64	98.5%*

The natural and disturbed vegetation types have been discussed in Table 11-13

11.5.1.3 Sensitivity of the Proposed Project Site

11.5.1.3.1 Present Ecological State

Table 11-9 indicates the PES scores for the various HGM Units.

The wetlands within the proposed project area exhibit a variety of PES values, ranging from Moderately Modified (Category C) to Largely Modified (Category D). Two Moderately Modified (Category C) wetlands were identified (HGM units 1 and 2). These wetlands were mainly impacted on by cultivation and/or grazing with few geomorphological impacts.

Two Largely Modified (Category D) wetlands are present in the proposed project area (HGM Unit 3 and HGM Unit 4). The Largely Modified category is mainly attributed to habitat transformation and dams in the case of HGM Unit 3. Plan 7 in Appendix B present the PES score for the HGM units within the proposed project area.

Table 11-9: Present Ecological Health Scores

HGM Unit	Hydrological Health Score	Geomorphological Health Score	Vegetation Health Score	Final Ecological Health Score	PES Score
1	3	0.3	7.4	3.5	C
2	2	0.3	5.3	2.4	C
3	6	1.1	7.8	5.1	D
4	3.5	0.9	9.2	4.4	D

11.5.1.3.2 Ecological Importance and Sensitivity

Table 11-10 indicates the Ecological Importance and Sensitivity (EIS) scores for the various HGM Units with the final EIS score for the wetlands ranging from Low (1) to High (2.5).

Although the wetlands are modified, they do still provide predominantly High to Low hydrological importance services (ranging between 1 and 2), such as flood attenuation and assimilation of toxicants and nitrates.

Due to the largely transformed nature of HGM Unit 4, this wetland provides little habitat for fauna and flora, whilst HGM Units 1, 2 and 3 still have large areas of intact vegetation. It is noted however that no red data species are located within the footprint of the proposed pipeline.

In general, the values are *Low* for 'Direct Human Benefits' (aside from the channelled valley bottom) due to restricted access by the mine. Some agriculture does occur, however this is minimal when compared to the size of the HGM units. Plan 8 in Appendix B shows the EIS score for the HGM units within the proposed project area.

Table 11-10: EIS Scores

HGM Unit	Ecological Importance & Sensitivity	Hydrological/Functional Importance	Direct Human Benefits	Final EIS Score	Final EIS Category
1	2.5	2	1	2.5	B
2	1.8	1.1	0.8	1.8	C
3	1.4	1.6	1.7	1.7	C
4	1	1	0.3	1	D

11.5.1.3.3 Flora Sensitivity

Due to the transformed nature of most of the habitat types and the fact that the pipeline is placed in the road servitude, the sensitivities are not high. The cultivated fields, alien clumps, and disturbed areas are demarcated as low sensitivity with the wetland areas and depression characterised as medium sensitivity (Plan 9 in Appendix B).

11.6 Cultural Heritage

11.6.1 Geology and Palaeontological Sensitivities

The regional and local study areas form part of the Highveld Coalfield, which extends approximately 7 000 km², and is predominantly underlain by the Main Karoo Basin (Johnson, et al., 2006). This basin comprises lithostratigraphic units associated with the Karoo Supergroup and dates to the Late Carboniferous to Middle Jurassic Periods (roughly 320 to 145 million years ago (mya)). The Karoo Supergroup is well known for the terrestrial

vertebrate fossils, distinctive plant assemblages, thick glacial deposits and extensive dolerite dykes and sills among the sediments (Johnson, et al., 1996; 2006).

Within the Karoo Supergroup are the sediments of the Eccca Group (dating to the Permian Period). These Eccca Group sediments are well-known for the wealth of plant fossils, characterised by assemblage of *Glossopteris* (plant species which are defined through fossil leaves) and contain significant coal reserves (Groenewald & Groenewald, 2014).

The proposed project is underlain by the Eccca Group and Transvaal Supergroups. Formations within the Eccca Group include:

- **The Pietermaritzburg Formation**, which rarely forms good outcrops and fossils are rare and difficult to find. This formation is of moderate palaeontological sensitivity;
- **The Vryheid Formation**, which is the main coal-producing formation in South Africa. This formation has produced a number of fossils, including extensive *Glossopteris* assemblages. Other fossils reported from this formation include: trace fossils, rare insects, possible conchostracans (bivalve crustaceans and shrimp clams, which are presently still extant), non-marine bivalves and fish scales; and
- **The Volksrust Formation**: monotonous sequence of grey shale. Fossils are significant but rare and include: temnospondyl amphibian remains, invertebrates and minor coal with plant remains, petrified wood and trace fossils assemblages (Groenewald & Groenewald, 2014).

The Vryheid Formation has a very-high palaeo-sensitivity (SAHRA, 2013b; 2017) and is the primary potential fossil-bearing layer underlying the site-specific study area. The Vryheid Formation corresponds to the basal unit of the Eccca Group, which was deposited roughly 180 mya in a deltic environment (Bamford, 2016).

Shales, sandstones, mudstones and coal feature all constitute this formation (Bamford, 2016). Coal is formed through the compression and heat alteration of plant matter. During the formation of coal, alteration happens to such an extent that potential plant fossil remains are no longer recognisable. The shales between the coal horizons, however, have the potential to preserve very good examples of plant fossils (Bamford, 2014; 2016). To a lesser extent, the sandstone surface outcrops may also preserve fossil plants. Coal deposits can potentially also include fossils of mammal-like reptiles and mammals. These are however, rarely, if ever, preserved with plant fossils (Bamford, 2012; 2016).

The Transvaal Supergroup is represented within the local study area as outcrops of the Rooiberg Group. Fossils associated with the Transvaal Supergroup potentially include thick deposits of stromatolites (the ancient predecessors of modern algal mats) and stromatolitic dolomite (Groenewald & Groenewald, 2014). Despite its low palaeontological sensitivity and the presence of these fossils in other lithic units of the Transvaal Supergroup, no such fossils have as yet been recorded in the Rooiberg Group (Groenewald & Groenewald, 2014; SAHRA, 2013c). This is most likely because of the fluvial depositional setting of the group and the subsequent metamorphic processes which have taken place within the layers.

11.6.2 Stone Age

The review of available data highlighted very few expressions of Middle Stone Age (MSA) (3 records accounting for 0.5% of the total identified heritage resources in the regional study area) and Middle Stone Age (LSA) (1 records or 0.2%). Further discussions on the Stone Age period have been included in the Heritage Specialist Study Report (Appendix D). This has not been discussed further as no heritage resources were found within the footprint of the proposed pipeline.

11.6.3 Farming Community Period

The farming community period is defined by the movements of Bantu-speaking agro-pastoralists into southern Africa. This movement included ancestors of modern Sotho-Tswana and Nguni peoples (Makhura, 2007).

Within the local study area, Type V settlements are the most common and most widely distributed and these sites occur around Bethel and Ermelo in the south-east region of Mpumalanga. The settlements include of a number of primary enclosures that are grouped around a ring (Maggs, 1976). The enclosures can be either contiguous or linked by secondary walling to form a secondary enclosure. There may also be free-standing structures around the periphery of the settlement, but there is no surrounding wall.

Ceramic and evidence for domesticated animals (such as dung deposits or faunal remains) can also be used to identify Late Farming Communities (LFC) sites. These objects can provide motivation for settlements and possible trade networks (Delius, et al., 2014) and are distributed across the region. Huffman (2007) provides a reference for the possible distribution of ceramic facies within the regional study area; this is summarised in Table 11-11.

Table 11-11: Ceramic facies commonly found in Mpumalanga (Huffman 2007)

Facies	Key Characteristics	Period
Uitkomst	Stamped arcades, appliqué and blocks of parallel incisions, stamping and chord impressions	1650 CE – 1820 CE
Rooiberg	Stamped rim band, mixture of stamped and incised bands, arcades and triangles in the neck	1650 CE – 1750 CE
Icon	Multiple incised bands separated by colour and lip decorations on bowls	1300 CE – 1500 CE
Madikwe	Multiple bands of cord impressions, incisions, stabs and punctates separated by colour	1500 CE – 1700 CE
Letaba	Hatched bands on shoulder, below black and red triangles	1600 CE – 1840 CE
Klingbeil	Triangles in neck bordered with slashes, punctates on shoulder	1000 CE – 1200 CE

11.6.4 The Historical Period

The historical period¹ is commonly defined as the period characterised by contact between Europeans and Bantu-speaking African groups and is characterised by the written records associated with this interaction.

Historical heritage resources within the regional study area are represented as:

- The battlefield associated with the Battle of Bakenlaagte;
- Burial grounds and graves, ranging from single burials to graveyards containing over one hundred individuals; and
- Historical built environment resources, such as structural remains (stonewall structures, homesteads, farmhouses and functional structures) and structural complexes; middens and ash deposits.

Further discussion on The Historical Period is found in Section 5.2.4 in the Heritage Specialist Study Report (Appendix D). This has not been discussed further as no heritage resources were found within the footprint of the proposed pipeline.

11.7 Description of the Current Land Uses

The pipeline is proposed to be located within the current road reserve. The land uses which have been identified around the pipeline include the following:

- Mining (GGV mine (including TWRP) and Mbali Colliery);
- Agricultural and Cattle Farming; and
- Roads, powerlines, bridges and railway lines.

11.8 Description of Specific Environmental Features and Infrastructure on the Site

The following environmental features and infrastructure have been identified on the route where the pipeline is proposed.

11.8.1 Water Resources

The proposed pipeline falls in the Upper Olifants Water Management Area (WMA) which is WMA 04, within the B11F quaternary catchment. The pipeline is proposed to cross the Klippoortjiespruit at 29°06'09.06"S and 29°06'31.01"E. The pipeline will be constructed along the existing Klippoortjiespruit Bridge thereby minimising the impact associated with


¹ In southern Africa, especially in Mpumalanga, the last 500 years represents a formative period that is marked by enormous internal economic invention and political experimentation that shaped the cultural contours and categories of modern identities outside of European contact. This period is currently not well documented, but is being explored through the 500 year initiative (Swanepoel, et al., 2008).

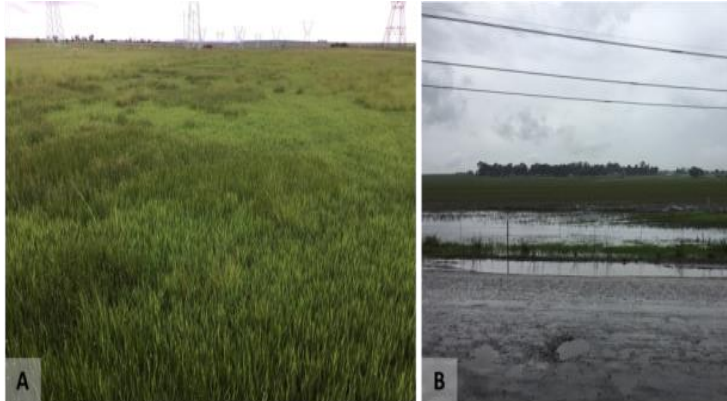
any new culverts or developments to cross the river. The river is considered to be heavily impacted upon due to the mining and farming activities located within the area.


11.8.2 Wetlands

A description for each HGM Units which was identified within the proposed project area is included in Table 11-12.

Table 11-12: HGM Unit identified within the proposed project area

HGM Unit	Description	Photographic Evidence
<p>HGM Unit 1: un-channelled valley bottom wetlands</p>	<ul style="list-style-type: none"> ▪ It has gentle slopes and is dominated by <i>Paspalum dilatatum</i> (Dallis Grass), <i>Eragrostis curvula</i> (Weeping Lovegrass) and <i>Juncus effusus</i> (Common Rush). <i>Erythrina zeyheri</i> (Plough-breaker) and <i>Crinum bulbispermum</i> (Orange River Lily, protected species) which both favour wetland areas, were also observed. ▪ Impact to these wetlands includes agriculture and road crossings. Cropland has replaced nature vegetation thereby reducing biodiversity. Cattle grazing has resulted in overgrazing, trampling and erosion. In addition, this impact has resulted in impaired water quality of the wetlands associated with the site. ▪ Disturbance has also led to the establishment of alien and invasive plant species, further limiting the ability of the hydromorphic grasslands to function. ▪ The pipeline is proposed to cross this wetland by way of the existing road bridge, as illustrated in Plan 15 in Appendix B. 	 <p>The photographic evidence consists of four images labeled A, B, C, and D. Image A shows a wide, flat, green grassy field under a cloudy sky. Image B shows a muddy, eroded path cutting through a green, wetland-like area. Image C shows a close-up of a hand holding a dark, moist soil sample. Image D shows a field with rows of crops, possibly corn, in a field with some bare soil between the rows.</p>

HGM Unit	Description	Photographic Evidence
<p>HGM Unit 2: depression wetlands</p>	<ul style="list-style-type: none"> ▪ The depression is inundated with water and displays vegetation that favours this environment. The wetland was mainly intact with the major impacts on the periphery of the wetland. ▪ The major impacts to these wetlands include: <ul style="list-style-type: none"> ▪ The powerlines and associated servitude within the depression wetland has resulted in disturbance to the system; ▪ Croplands have replaced some of the naturally occurring vegetation; and ▪ The depression is impacted on by a road, which has resulted in some fragmentation of the natural system, compaction of soils in some places and loss of vegetation. 	

HGM Unit	Description	Photographic Evidence
<p>HGM unit 3: channelled valley bottom wetland</p>	<ul style="list-style-type: none"> ▪ A channelled valley bottom that runs parallel a section of the proposed pipeline and Mbali access road. ▪ This wetland has been largely impacted as a result of the following: <ul style="list-style-type: none"> ▪ Dams are abundant and have impacted severely on the wetland integrity of the site, causing headcut erosion upstream and in-stream erosion downstream; ▪ Edge effects related to mining activities have resulted in impacts to water quality of the wetland; ▪ The impact of the road crossings is large as culvert design is considered insufficient to allow for the flow of water underneath the roads; and ▪ Croplands along the edges of the wetland have replaced some of the naturally occurring vegetation. 	


HGM Unit	Description	Photographic Evidence
<p>HGM unit 4: hillslope seep wetland</p>	<ul style="list-style-type: none"> ▪ A hillslope seep feeds into the channelled valley bottom wetland (HGM Unit 3) ▪ This wetland has been largely impacted as a result of the following: <ul style="list-style-type: none"> ▪ Edge effects related to mining activities have resulted in impacts to water quality of the wetland (the wetland falls partly within the approved Mbali Mining Right Area); ▪ Edge effects related to adjacent mining activities have resulted in loss of the wetland habitat and biodiversity; ▪ Croplands along the edges of the wetland have replaced some of the naturally occurring vegetation; and ▪ Cattle-grazing activities have resulted in the loss of wetland ecological integrity. 	

11.8.3 Flora

The natural and disturbed vegetation types are discussed in Table 11-13 below.

Table 11-13: The Natural and Disturbed Vegetation Types

Vegetation Type	Description
<p>Natural : Valley Bottom Wetland Habitat</p>	<p>This habitat is associated with the un-channelled and channelled valley bottom wetlands that run through the project area. These areas are gently sloping and comprise of hydromorphic grasslands. Where standing water was present; <i>Typha capensis</i> (Common Bulrush), <i>Imperata cylindrica</i> (Cottonwool Grass), <i>Cyperus fastigiatus</i> had colonised. The slopes were dominated by <i>Eragrostis</i>, <i>Agrostis lacnantha</i> <i>Paspalum dilatatum</i> and various herbs such as <i>Monopsis decipiens</i> and <i>Chlorophytum fasciculatum</i>. <i>Crinum bulbispermum</i> (Orange River Lily), which is abundant in this vegetation unit, is provincially protected (according to Mpumalanga Nature Conservation Act, 1998 (Act No. 10 of 1998): Schedule 11). Alien plant species that had colonised this vegetation unit included: <i>Acacia mearnsii</i> (Black Wattle) seedlings, and <i>Cirsium vulgare</i> (Scotch Thistle).</p> <p>The species found within the proposed project area have been discussed in Table 6.3 within the Wetland Specialist Report (Appendix E).</p> <div style="display: flex; justify-content: space-around;">   </div> <div style="display: flex; justify-content: space-around;">   </div> <p style="text-align: center;">Valley Bottom Wetland Habitat Vegetation Types</p>

Vegetation Type	Description
Natural: Depression	<p>The depression habitat encountered was characterised by short sedges (e.g. <i>Eleocharis dregeana</i>, <i>Schoenoplectus decipiens</i>) that were inundated with water. Grass species such as <i>Leersia hexandra</i> were also found in the permanent wet zone with <i>Setaria sphacelata</i> in the temporary and seasonal zones. Herb species such as <i>Asclepias gibba var gibba</i> and <i>Kohautia amatymbica</i> were scattered throughout the depression.</p> <p>Very few alien plant species had colonised this vegetation unit aside from <i>Verbena bonariensis</i>. Species characteristic of this habitat can be seen in Table 6 4 within the Wetland Specialist Report (Appendix E).</p>  <p>Depression Habitat Vegetation Types</p>
Disturbed Grassland / mowed servitude	This habitat has been mowed and therefore species identification was not possible. These areas were located where powerlines were present.
Alien Bushclumps	Small alien bushclumps colonised road reserves. These included <i>Bidens pilosa</i> (Black Jack), <i>Conyza albida</i> (Fleabane) and <i>Cosmos bipinnatus</i> (Garden Cosmos).
Cultivated areas	This habitat was completely transformed by maize and soybean farming.

11.8.4 Cultural Heritage

No heritage resources or palaeontological surface features (i.e. outcrops of palaeontologically significant formations) were identified within the proposed pipeline route. Historical layering was undertaken to identify potential structures that may be older than 60 years and would therefore be protected under Section 34 of the NHRA. No such structures were identified on the historical map.

Palaeontologically sensitive layers, as described in Section 11.6.1, underlie the proposed development footprint. Based on the understanding of the Project, i.e. a pipeline, with superficial disturbance to the surface, no impact to the palaeontological layers are envisaged.

Recorded heritage resources within proximity to the proposed routing occur outside of the development footprint (refer to Plan 10 in Appendix B). No new heritage resources within the development footprint were identified during the pre-disturbance survey. There are therefore no sensitivities associated with cultural heritage.

11.8.5 Infrastructure and Facilities

The pipeline is proposed to be constructed within the road reserve which will be constructed from the TWRP to the Mbali Colliery. Infrastructure which is located between the TWRP and the Mbali Colliery has been discussed below:

- Powerlines located within the road reserve. These are however located on the opposite side of where the pipeline is proposed to be constructed;
- Regional and secondary roads such as the R545 which is the main road utilised to access the area. Additionally secondary roads are utilised to both access farming areas as well as the Mbali Colliery. Most of the roads are paved roads; and
- Bridges and culverts have been constructed along the R545 which is utilised to permit natural water flow as well as to cross the Klippoortjiespruit.

11.8.6 Environmental and Current Land Use Map

Refer to the environmental and current land use map Plan 11 in Appendix B. Current land use is described in Section 11.7.

12 Impacts and Risks Identified Including the Nature, Significance, Consequence, Extent, Duration and Probability of the Impacts, Including the Degree to which these Impacts

This section aims to rate the significance of the identified potential impacts and risks pre-mitigation and post-mitigation. It should be noted that an impact arises from a planned event while a risk arises from an unplanned event. Therefore both risks and impacts have been assessed below to ensure sound environmental management practices.

The potential impacts / risks identified in this section are a result of both the environment in which the project activities takes place, as well as the actual activities. The potential impacts / risk are discussed per aspect and per each phase of the project i.e. the Construction Phase, Operational and Decommissioning/Post Closure Phases.

The following activities for the proposed construction of the pipeline which has been assessed are listed below:

- **Construction Phase:**
 - The Construction Phase involves the clearance of vegetation (Where vegetation is present) and removal of topsoil followed by trenching (maximum depth of 3 m) and stockpiling topsoil (maximum height of 3 m) and sub-soil along the pipeline route. Once trenched, the pipeline will be installed, the excavation backfilled and topsoil reinstated.
- **Operational Phase:**
 - The Operational Phase involves the pumping of water from the TWRP at the GGV Mine, to the Mbali Colliery Coal Wash Plant where the water will be utilised to supplement the water obtained from the PCD and open pits to wash the coal before it is sold. It should be noted that the coal wash plant has already been authorised under the EMPR (Reference No. MP 30/5/1/2/2 228 MR) in accordance with NEMA and the MPRDA.
- **Rehabilitation and Decommissioning Phase:**
 - The Decommissioning and Rehabilitation Phase will see the removal of the pipeline and rehabilitation of the pipeline route. It should be noted that this phase will only be implemented should Mbali Colliery decide to remove the pipeline and rehabilitate the area. The decommissioning of the pipeline will require environmental authorisation in accordance with NEMA and therefore further impacts and mitigation measures will be proposed at the time of decommissioning planning. However, Mbali Colliery may decide, once the pipeline is no longer in use, to leave the pipeline in-situ which will prevent further disturbance to the environment. If this option is selected this phase will not be required.

A list of unplanned events that may happen at the project site have been identified and the proposed mitigation plan are listed in Part B Table 10-2.

It should be noted as no heritage resources were identified within the proposed pipeline route, no direct impact to heritage resources is envisaged. No surface outcrops of the palaeontologically significant layers were identified during the pre-disturbance survey. The Project is understood to have superficial surface disturbance. It is therefore unlikely that the Project will impact on the palaeontologically-sensitive layers of the Vryheid Formation. Therefore no impacts have been identified and discussed further in this report.

12.1 Construction, Operation and Decommissioning Phase

The impacts associated with the construction phase of the pipeline have been discussed in Table 12-1. The impacts associated with the operational phase of the pipeline have been discussed in Table 12-2 and the impacts associated with the decommissioning phase of the pipeline have been discussed in Table 12-3.

The location of pipeline infrastructure occurs either within the delineated freshwater feature areas or within the 32 m or 100 m zones of regulation according to NEMA and Regulation GN704 of the NWA. Therefore measures should be implemented during the planning and pre-construction phase to preserve wetland functionality and integrity prior to any disturbances or impacts associated with the proposed project through optimal site selection of the proposed infrastructure. The measures that should be considered in the design phase have been incorporated in Table 12-1. Implementation of these measures prior to the construction phase will result in avoidance of certain impacts that could otherwise require significant management on site.

Table 12-1: Impact Assessment Associated with the Construction Phase of the Pipeline

Phase	Activity	Aspect	Impact	D ²	E ³	I ⁴	P ⁵	N ⁶	C ⁷	S ⁸	Rating (Pre Mitigation)	Mitigation Measures	D ²	E ³	I ⁴	P ⁵	N ⁶	C ⁷	S ⁸	Rating (Post Mitigation)
Construction Phase	Proposed pipeline route and design	Flora & Wetlands	The location of pipeline infrastructure occurs either within the delineated freshwater feature areas or within the 32 m or 100 m zones of regulation according to NEMA and Regulation GN704 of the NWA.	5	4	4	4	-1	13	-52	Minor (negative) -	<ul style="list-style-type: none"> Ensure that as far as possible all infrastructures result in the least disturbance to delineated freshwater features present; Ensure that sound environmental management is in place during the planning phase as discussed in the site clearing, access and construction of berms impact for wetlands below; Design of infrastructure should be environmentally and structurally sound and all possible precautions taken to prevent spillage to the surface water resources present; and Impacts to surface wetlands are reduced as the proposed pipeline remains within the road reserves and attached to the existing bridge, as opposed to being trenched through water resources (the Klippoortjiespruit), thus minimizing additional fragmentation of the systems. 	2	2	2	3	1	6	18	Negligible (positive) +
Construction Phase	Construction of the Pipeline and associated clearance activities	Surface Water / Aquatic Ecology	Potential contamination of water from hydrocarbons, as a result of the construction vehicles utilised.	2	3	4	6	-1	9	-54	Minor (negative) -	<ul style="list-style-type: none"> Construction vehicles and machinery repairs must only take place in a designated workshop area at the Mbal Colliery; Vehicles must be maintained according to their maintenance plans; Stationary vehicles should have a drip dray placed below the machine; Machinery and vehicles should be stored at Mbal Colliery when not in use. Extra precautions should be taken in areas within 500 meters of the Klippoortjiespruit to prevent any potential impact to the water course this includes effective stormwater control measures around soil stockpiles to prevent sedimentation of the river. 	2	2	4	3	-1	8	-24	Negligible (negative) -

² Duration
³ Extent
⁴ Intensity
⁵ Probability
⁶ Nature
⁷ Consequence
⁸ Significance

Phase	Activity	Aspect	Impact	D ²	E ³	I ⁴	P ⁵	N ⁶	C ⁷	S ⁸	Rating (Pre Mitigation)	Mitigation Measures	D ²	E ³	I ⁴	P ⁵	N ⁶	C ⁷	S ⁸	Rating (Post Mitigation)
Construction Phase	Site clearing, access and construction of berms	Flora & Wetlands	<p>Increased vehicular movement along river crossings and within wetland/riparian zones, resulting in:</p> <ul style="list-style-type: none"> Potential contamination of soils as a result of the ingress of hydrocarbons; Compaction of soils; Loss of natural vegetation; Increased sedimentation; and Increased potential for erosion. 	5	4	4	4	-1	13	-52	Minor (negative) -	<ul style="list-style-type: none"> Ensure soil management programme is implemented and maintained to minimise erosion and sedimentation; During the construction phase, erosion berms should be installed on roadways and downstream of stockpiles to prevent gully formation and siltation of the freshwater resources. The following points should serve to guide the placement of erosion berms: <ul style="list-style-type: none"> Where the track has slope of less than 2%, berms every 50 m should be installed; Where the track slopes between 2% and 10%, berms every 25 m should be installed; Where the track slopes between 10%-15%, berms every 20 m should be installed; and Where the track has slope greater than 15%, berms every 10 m should be installed. Active rehabilitation, re-sloping, and re-vegetation of disturbed areas immediately after construction; Limit the footprint area of the construction activities to what is absolutely essential in order to minimise impacts as a result of vegetation clearing and compaction of soils (all areas but critically so in wetland areas); If it is absolutely unavoidable that any of the wetland areas present will be affected, disturbance must be minimised and suitably rehabilitated; Ensure that no incision and canalisation of the wetland features present takes place; All erosion noted within the construction footprint should be remedied immediately and included as part of an ongoing rehabilitation plan; Soils which were compacted as a result of construction activities should be ripped/scarified (<300 mm) and profiled; A suitable Alien Invasive Plant (AIP) control programme must be put in place so as to prevent further encroachment as a result of disturbance to the surrounding terrestrial zones; Permit only essential personnel within the 32 or 100 m zones of regulation for all freshwater 	5	2	2	3	-1	9	-27	Negligible (negative) -

Phase	Activity	Aspect	Impact	D ²	E ³	I ⁴	P ⁵	N ⁶	C ⁷	S ⁸	Rating (Pre Mitigation)	Mitigation Measures	D ²	E ³	I ⁴	P ⁵	N ⁶	C ⁷	S ⁸	Rating (Post Mitigation)					
												features identified; <ul style="list-style-type: none"> No unnecessary crossing of the wetland features and their associated buffers should take place and the substrate conditions of the wetlands and downstream stream connectivity must be maintained; No material may be dumped or stockpiled within or within 500 metres of any rivers, tributaries or drainage lines in the vicinity of the proposed pipeline; No vehicles or heavy machinery may be allowed to drive indiscriminately within any wetland areas and their associated zones of regulation. All vehicles must remain on demarcated roads and within the construction footprint; All vehicles must be regularly inspected for leaks; Re-fueling must take place at the Mbali diesel facility, on a sealed surface area away from wetlands to prevent ingress of hydrocarbons into topsoil; All spills should be immediately cleaned up and treated accordingly; Wetlands should be monitored monthly during construction; and Appropriate sanitary facilities must be provided for the duration of the construction activities and all waste must be removed to an appropriate waste facility. 													
Construction Phase	Construction of the Pipeline and associated clearance activities	Soil, Land Use and Land Capability	During the pipeline construction, soil erosion and contamination are possible. The soil impacts may be a result of vegetation (where applicable) and topsoil removal for the pipeline and laydown areas, as well as compaction caused by vehicle and machinery onsite.	2	2	4	5	-1	8	-40	Minor (negative) -	<ul style="list-style-type: none"> The pipeline must be constructed in sections not exceeding 100m per section. A maximum of 4 sections may be active at the same time, by the undertaking of one of the following activities per section: <ul style="list-style-type: none"> Vegetation Clearance; Digging of the trench; Installation of the pipeline; or Backfilling of the trench and rehabilitation of the footprint. This means that no more than 400m of pipeline route will be affected at any given time, and concurrent rehabilitation of the pipeline footprint will be implemented. For example, the project will commence with vegetation clearance on Section 	2	2	2	3	-1	6	-18	Negligible (negative) -					

Phase	Activity	Aspect	Impact	D ²	E ³	I ⁴	P ⁵	N ⁶	C ⁷	S ⁸	Rating (Pre Mitigation)	Mitigation Measures	D ²	E ³	I ⁴	P ⁵	N ⁶	C ⁷	S ⁸	Rating (Post Mitigation)	
												<p>1. Once complete, vegetation clearance can continue to Section 2, while excavation of the trench can commence on Section 1. Once complete, vegetation clearance will continue to Section 3, with trench excavation continuing on Section 2, and pipe installation commencing on Section 1. Finally, Section 1 will be backfilled and rehabilitated, Pipe installation will be undertaken in Section 2, Excavation of the trench will progress to Section 3 and vegetation clearance will progress to Section 4 of the pipeline route. Soil removed for the pipeline construction should be stockpiled and utilised as backfill once each section of pipeline has been constructed;</p> <ul style="list-style-type: none"> ▪ Soil should be deposited on top of the pipeline up to or above ground level so as to prevent trenches from developing which can result in increased erosion; ▪ Where the pipeline has been constructed within the road reserve and no vegetation is present, the area should be rehabilitated and soil compacted. No vegetation is required to be established within these areas; ▪ Suitable stormwater management measures must be implemented to prevent the loss of soil during rainfall events; ▪ All surfaces that are susceptible to erosion shall be covered with a suitable vegetative cover as soon as construction is completed. ▪ Rehabilitation to be monitored on an annual basis for three years on completion of the construction phase; ▪ Areas where vegetation is cleared (either for the pipeline where vegetation is present or for the laydown area), should be rehabilitated with a suitable vegetation cover once construction has been completed; ▪ The refueling of vehicles must take place either at Mbali Colliery or a petrol station; and ▪ Stockpiling of the pipes to be installed must be limited to only what is required and only be stored in designated areas to avoid any unnecessary soil compaction. 									

Phase	Activity	Aspect	Impact	D ²	E ³	I ⁴	P ⁵	N ⁶	C ⁷	S ⁸	Rating (Pre Mitigation)	Mitigation Measures	D ²	E ³	I ⁴	P ⁵	N ⁶	C ⁷	S ⁸	Rating (Post Mitigation)
Construction Phase	Construction of the Pipeline and associated clearance activities	Air Quality	Dust generated from site clearing, soil transportation, vehicle movement and the construction of the pipeline.	2	3	2	6	-1	7	-42	Minor (negative) -	<ul style="list-style-type: none"> The disturbed areas must be kept to a minimum and it is advised to not clear vegetation unnecessarily; and Water or a chemical dust suppressant should be used to dampen dust generating areas such as areas where soil has been exposed. 	2	3	2	4	-1	7	-28	Negligible (negative) -
Construction Phase	Construction of the Pipeline and associated clearance activities	Groundwater	Contamination of groundwater due to hydrocarbon spillages.	2	3	4	3	-1	9	-27	Negligible (negative) -	<ul style="list-style-type: none"> Construction vehicles and machinery repairs must only take place in the designated workshop areas at the Mbali Colliery; Vehicles must be maintained according to their maintenance plans; Stationary vehicles should have a drip tray placed below the machine; and Machinery and vehicles should be stored at Mbali Colliery when not in use. 	2	2	4	2	-1	8	-16	Negligible (negative) -
Construction Phase	Construction of the Pipeline and associated clearance activities	Social	Creation of jobs during the construction phase of the pipeline	2	3	1	5	1	6	30	Negligible (positive) +	<ul style="list-style-type: none"> Where feasible, promote the creation of employment opportunities for women and youth; Where possible, construction workers and other service providers will be recruited from the Ogies, Kendal, Kriel and surrounding areas to increase employment opportunities for directly affected and local communities; Establish a monitoring system to ensure that the subcontractors honour the specified local employment policy; and If required, the local resident status of applicants should be verified in consultation with community representatives and local government. 	2	3	2	6	1	7	42	Minor (positive) +

Table 12-2: Impact Assessment Associated with the Operational Phase of the Pipeline

Phase	Activity	Aspect	Impact	D ²	E ³	I ⁴	P ⁵	N ⁶	C ⁷	S ⁸	Rating (Pre Mitigation)	Mitigation Measures	D ²	E ³	I ⁴	P ⁵	N ⁶	C ⁷	S ⁸	Rating (Post Mitigation)
Operational Phase	Operation of the pipeline	Surface Water / Aquatic Ecology	Surface water quality / quantity may be impacted upon should a leak occur in the pipeline as the water quality is not currently known. A sudden burst in the pipeline will result in a sudden increase of water into the surface water resources and can result in an impact on both water quality and quantity.	6	4	5	6	-1	15	-90	Moderate (negative) -	<ul style="list-style-type: none"> Flow meters must be installed at either end of the pipeline to ensure that the same amount of water leaving TWRP, enters the Mbali Colliery; These reading should be taken on a daily basis and reported on monthly to HCI headquarters. Additionally these readings should be incorporated into the quarterly surface and groundwater monitoring report currently being undertaken for Mbali which is submitted to DWS; Comparisons between the volumes dispensed and received should be made to ensure no leaks in the pipeline have occurred; Should a variation be identified, further investigation must be undertaken to identify the location of the leak. Any leaks in the pipeline must be repaired immediately; and Surface water monitoring must be implemented at the locations identified in Part B Section 8.1.2. 	6	2	4	3	-1	12	-36	Minor (negative) -
Operational Phase	Operation of the pipeline	Surface Water	The operation of the pipeline will result in an increased amount of water being utilised within the coal washplant which could result in increased contaminated water run-off. This can lead to potential additional surface water contamination if not contained correctly.	6	4	4	6	-1	14	-84	Moderate (negative) -	<ul style="list-style-type: none"> Effective stormwater management must be implemented / improved on at the coal wash plant, PCD, and slurry ponds at Mbali to ensure that the increased amount of water to be discharged is contained in the PCD or slurry ponds and to prevent the siltation of these water containment facilities; The PCD and slurry pond are lined and are not expected to seep. This however needs to be confirmed and the integrity of the liner should be verified. A water balance will assist in achieving this and confirm if the liner is not leaking; All surface water pollution control structures will be inspected on a daily basis and maintenance work carried out as required. Furthermore, all structures (e.g. dams) registered in terms of the NWA will be maintained in accordance with the Act; All water management containment facilities must be maintained and is required to operate with a 0.8 m freeboard and able to contain a 1:100 year flood event; Additional surface water monitoring points should 	6	3	2	4	-1	11	-44	Minor (negative) -

Phase	Activity	Aspect	Impact	D ²	E ³	I ⁴	P ⁵	N ⁶	C ⁷	S ⁸	Rating (Pre Mitigation)	Mitigation Measures	D ²	E ³	I ⁴	P ⁵	N ⁶	C ⁷	S ⁸	Rating (Post Mitigation)	
												be incorporated into the Mballi Colliery water monitoring network to ensure no further contamination on surface water resources occur (Ref to Part B Section 8.1.2); and									
												<ul style="list-style-type: none"> Should contamination be identified further investigation should be undertaken to identify the source of contamination and implement mitigation measures to prevent further contamination. 									
Operational Phase	Potential spills or leaks from pipeline infrastructure and resulting disturbance to soils	Flora & Wetlands	Among the impacts associated with the proposed project are potential impacts to soil and water quality as a result of the ingress of spills associated with the pipeline. Additionally alien invasive species are anticipated to impact on natural vegetation	5	4	4	4	-1	13	-52	Minor (negative) -	<ul style="list-style-type: none"> Leak detection will be necessary. Flow meters must be fitted at the start and end of the pipeline to detect if there are any water losses; All erosion noted within the operational footprint as a result of surface activities should be remedied immediately and included as part of the ongoing rehabilitation plan; Maintenance of erosion berms; A suitable AIP control programme must be put in place so as to prevent further encroachment as a result of disturbance to the surrounding terrestrial zones; Permit only essential personnel within the 32 or 100 m zones of regulation for all wetland features identified; No unnecessary crossing of the wetland features and their associated buffers should take place and the substrate conditions of the wetlands and downstream stream connectivity must be maintained; No material may be dumped or stockpiled within or within 500 metres of any rivers, tributaries or drainage lines in the vicinity of the proposed pipeline; All spills from maintenance vehicles or leaks from the pipeline should be immediately cleaned up and treated accordingly; and Monitor all systems for erosion and incision 	5	2	2	2	-1	9	-18	Negligible (negative) -	
Operational Phase	Operation of the pipeline	Soil, Land Use and Land Capability	Soil erosion due to loss of vegetation along the pipeline route	6	1	3	5	-1	10	-50	Minor (negative) -	<ul style="list-style-type: none"> Twice a year inspections of the pipeline route should be undertaken to ensure that soil erosion has not occurred along the pipeline route; and Areas where erosion has occurred should be rehabilitated. 	6	1	2	3	-1	9	-27	Negligible (negative) -	

Phase	Activity	Aspect	Impact	D ²	E ³	I ⁴	P ⁵	N ⁶	C ⁷	S ⁸	Rating (Pre Mitigation)	Mitigation Measures	D ²	E ³	I ⁴	P ⁵	N ⁶	C ⁷	S ⁸	Rating (Post Mitigation)
Operational Phase	Operation of the pipeline	Social	Continuation of jobs during the operational phase at the coal wash plant once LoM is reached at Mbali Colliery	6	3	2	4	1	11	44	Minor (positive) +	<ul style="list-style-type: none"> Empower the workforce to develop skills that could be transferred to other sectors of the economy; Training and skills development initiatives should be initiated; and Partner with existing community organisations and social departments to jointly assist affected communities, to strengthen the economic development opportunities provided as a result of the project. 	6	3	3	5	1	12	60	Minor (positive) +

Table 12-3: Impact Assessment Associated with the Rehabilitation and Decommissioning Phase of the Pipeline (Should this phase be undertaken)

Phase	Activity	Aspect	Impact	D ²	E ³	I ⁴	P ⁵	N ⁶	C ⁷	S ⁸	Rating (Pre Mitigation)	Mitigation Measures	D ²	E ³	I ⁴	P ⁵	N ⁶	C ⁷	S ⁸	Rating (Post Mitigation)
Decommissioning Phase	Decommissioning and rehabilitation of the pipeline	Surface Water / Aquatic Ecology	Potential contamination of water from hydrocarbons, as a result of the vehicles utilised during decommissioning.	2	3	4	6	-1	9	-54	Minor (negative) -	<ul style="list-style-type: none"> Repairs on vehicles and machinery utilised during decommissioning and rehabilitation must only take place in the designated workshop areas at the Mbali Colliery; Vehicles must be maintained according to their maintenance plans; Stationary vehicles should have a drip tray placed below the machine; Machinery and vehicles should be stored at Mbali Colliery when not in use; Extra precautions should be taken in areas within 500 meters of the Klippoortjiespruit to prevent any potential impact to the water course this includes effective stormwater control measures around soil stockpiles to prevent sedimentation of the river. 	2	2	4	3	-1	8	-24	Negligible (negative) -
Decommissioning Phase	Decommissioning and rehabilitation of the pipeline	Soil, Land Use and Land Capability	The underlying soil will be compacted and susceptible to erosion. Topsoil will need replacement on the pipeline route. Hydrocarbon spillages from vehicles and machinery used during decommissioning could contaminate soil resources.	2	2	4	5	-1	8	-40	Minor (negative) -	<ul style="list-style-type: none"> Immediately clean up any hydrocarbon spills in accordance with the hydrocarbon Standard Operating Procedure (SOP); Vehicles and machinery must be serviced in bunded areas at the Mbali Workshop; Suitable stormwater measures must be implemented to prevent the loss of soil to soil erosion; The pipeline should only be removed in sections. 	2	2	2	3	-1	6	-18	Negligible (negative) -

Phase	Activity	Aspect	Impact	D ²	E ³	I ⁴	P ⁵	N ⁶	C ⁷	S ⁸	Rating (Pre Mitigation)	Mitigation Measures	D ²	E ³	I ⁴	P ⁵	N ⁶	C ⁷	S ⁸	Rating (Post Mitigation)						
												<p>Once a certain area has been decommissioned and rehabilitated the next section can be removed to prevent extended impact to soil;</p> <ul style="list-style-type: none"> Soil should be stockpiled and utilised to rehabilitate the area once the pipeline has been removed. Soil should be deposited on top of the pipeline up to or above ground level so as to prevent trenches from developing which can result in increased erosion; Where the pipeline was placed within the road reserve and no vegetation is present, the area should be rehabilitated and soil compacted. No vegetation is required to be established within these areas; and Areas should be rehabilitated and vegetation allowed (where vegetation was previously cleared during decommissioning) to grow immediately after the pipeline has been removed; 														
Decommissioning Phase	Site access roads and pipeline crossing wetlands, Removal of infrastructure and rehabilitation	Flora & Wetlands	<p>Increased vehicular movement along river crossings and within wetland/riparian zones, resulting in:</p> <ul style="list-style-type: none"> Potential contamination of soils as a result of the ingress of hydrocarbons; Loss of natural vegetation; Increased sedimentation; Increased potential for onset of erosion; Potential dumping of decommissioned infrastructure in wetland/riparian areas; and Potential incomplete removal of infrastructure. 	5	4	4	4	-1	13	-52	Minor (negative) -	<ul style="list-style-type: none"> Limit the footprint area of the decommissioning and rehabilitation activities to what is absolutely essential in order to minimise impacts as a result of vegetation clearing and compaction of soils (all areas but critically so in wetland areas); All erosion noted within the decommissioning area footprint should be remedied immediately and included as part of the ongoing rehabilitation plan; All soils compacted as a result of decommissioning activities should be ripped/scarified (<300 mm) and profiled; Permit only essential personnel within the zones of regulation for all freshwater features identified; Wherever possible, restrict decommissioning activities to the drier winter months to avoid sedimentation of the freshwater resources further downstream; No material may be dumped or stockpiled within or within 500 metres of any rivers, tributaries or drainage lines in the vicinity of the proposed pipeline; Wetlands and their associated zones of regulation are to be clearly demarcated and 	5	2	2	3	-1	9	-27	Negligible (negative) -						



Phase	Activity	Aspect	Impact	D ²	E ³	I ⁴	P ⁵	N ⁶	C ⁷	S ⁸	Rating (Pre Mitigation)	Mitigation Measures	D ²	E ³	I ⁴	P ⁵	N ⁶	C ⁷	S ⁸	Rating (Post Mitigation)
												avoided wherever possible; <ul style="list-style-type: none"> ▪ An AIP management plan to be implemented and managed for the life of the proposed decommissioning, rehabilitation, closure and post-closure phases; ▪ As much vegetation growth as possible should be promoted within the proposed development area during all phases. In order to protect soils, vegetation clearance should be kept to a minimum; ▪ Monitor all systems for erosion and incision; ▪ All areas where active erosion is observed should be ripped, re-profiled and seeded with indigenous grasses; ▪ No vehicles or heavy machinery may be allowed to drive indiscriminately within any wetland areas and their associated zones of regulation. All vehicles must remain on demarcated roads and within the project area footprint; ▪ All vehicles must be regularly inspected for leaks; ▪ Re-fueling must take place at the Mbali diesel facility on a sealed surface area away from wetlands to prevent ingress of hydrocarbons into topsoil; ▪ All existing litter, debris should be removed from the wetland areas and littering should be prohibited on an ongoing basis; ▪ All spills from machinery should be immediately cleaned up and treated accordingly; ▪ Appropriate sanitary facilities must be provided for the duration of the rehabilitation activities and all waste must be removed to an appropriate waste facility; and ▪ Wetland monitoring should be carried out monthly during decommissioning and annually during rehabilitation; ▪ Ongoing wetland rehabilitation is necessary within and in the vicinity of the proposed decommissioning footprint and appropriate wetland monitoring techniques must take place on an annual basis during the summer/wet season in order to identify any emerging issues, trends or improvements in the receiving 								

Phase	Activity	Aspect	Impact	D ²	E ³	I ⁴	P ⁵	N ⁶	C ⁷	S ⁸	Rating (Pre Mitigation)	Mitigation Measures	D ²	E ³	I ⁴	P ⁵	N ⁶	C ⁷	S ⁸	Rating (Post Mitigation)	
												environment.									
Decommissioning Phase	Decommissioning and rehabilitation of the pipeline	Air Quality	The extent of impacts depends on the extent of demolition and rehabilitation efforts during decommissioning. Impacts of this activity on the atmospheric environment will be similar to the impacts during the construction phase. The impacts will be short-term and localised.	2	3	2	6	-1	7	-42	Minor (negative) -	<ul style="list-style-type: none"> Vegetation establishment (where vegetation was previously cleared away) must take place on the bare soil to prevent soil erosion and dust creation; Exposed soil must be kept moist using sprays or water tanks to prevent dust creation before vegetation is established (where vegetation was previously cleared away); and Vegetation (where previously cleared) should be planted during the wet season to ensure vegetation establishment and prevent unnecessary costs. 	2	3	2	4	-1	7	-28	Negligible (negative) -	
Decommissioning Phase	Decommissioning and rehabilitation of the pipeline	Groundwater	Contamination of groundwater due to hydrocarbon spillages from vehicles utilised during decommissioning activities.	2	3	4	3	-1	9	-27	Negligible (negative) -	<ul style="list-style-type: none"> Construction vehicles and machinery repairs must only take place in the designated workshop areas at the Mbali Colliery; Vehicles must be maintained according to their maintenance plans; Stationary vehicles should have a drip tray placed below the machine; and Machinery and vehicles should be stored at Mbali Colliery when not in use. 	2	2	4	2	-1	0	Negligible (negative) -		
Decommissioning Phase	Decommissioning and rehabilitation of the pipeline	Social	Creation of jobs during decommissioning and rehabilitation phase while the pipeline is being removed	2	3	1	5	1	6	30	Negligible (positive) +	<ul style="list-style-type: none"> Where feasible, promote the creation of employment opportunities for women and youth; Where possible, construction workers and other service providers will be recruited from the Ogies, Kendal, Kriel and surrounding areas to increase employment opportunities for directly affected and local communities; Establish a monitoring system to ensure that the subcontractors honour the specified local employment policy; and If required, the local resident status of applicants should be verified in consultation with community representatives and local government. 	2	3	2	6	1	7	42	Minor (positive) +	

12.2 Cumulative Impacts

The sense of place of a cultural landscape is already severely impacted by industrial and mining activities. Construction of the pipeline will add to the degradation of the sense of place. Due to the predicted impacts only occurring at a local extent, the proposed project is not expected to have significant cumulative impacts on the region.

If dust suppression is not implemented during construction and decommissioning cumulative impacts to deteriorating air quality may be experienced.

The predominant potential cumulative impact is associated with the surface water resources in the area. Should run off from the coal wash plant due to the increase quantity of water from the pipeline not be adequately contained and mitigation measures not be implemented, there is a possibility that the surface water quality of the catchment may be further impacted upon due to the water being discharged from the Mbali Colliery to the tributary to the Klippoortjiespruit. The surface water quality will have a potential impact on the wetlands, inhibiting their capacity to perform their ecological functions.

13 Methodology used in Determining and Ranking the Nature, Significance, Consequence, Extent, Duration and Probability of Potential Environmental Impacts and Risks

Details of the impact assessment methodology used to determine the significance of physical, bio-physical and socio-economic impacts are provided below.

The significance rating process follows the established impact/risk assessment formula:

$$\text{Significance} = \text{Consequence} \times \text{Probability} \times \text{Nature}$$

Where

$$\text{Consequence} = \text{Intensity} + \text{Extent} + \text{Duration}$$

And

$$\text{Probability} = \text{Likelihood of an impact occurring}$$

And

$$\text{Nature} = \text{Positive (+1) or negative (-1) impact}$$

Note: In the formula for calculating consequence, the type of impact is multiplied by +1 for positive impacts and -1 for negative impacts.

The matrix calculates the rating out of 147, whereby Intensity, Extent, Duration and Probability are each rated out of seven as indicated in Table 13-3. The weight assigned to the various parameters is then multiplied by +1 for positive and -1 for negative impacts.

Impacts are rated prior to mitigation and again after consideration of the mitigation measure proposed in this report. The significance of an impact is then determined and categorised into one of eight categories, as indicated in Table 13-2, which is extracted from Table 13-1. The description of the significance ratings is discussed in Table 13-3.

It is important to note that the pre-mitigation rating takes into consideration the activity as proposed, i.e. there may already be certain types of mitigation measures included in the design (for example due to legal requirements and engineering design principles). If the potential impact is still considered too high, additional mitigation measures are proposed.

Table 13-1: Impact Assessment Parameter Ratings

Rating	Intensity		Extent	Duration/Reversibility	Probability
	Negative Impacts (Nature = -1)	Positive Impacts (Nature = +1)			
7	Irreplaceable loss or damage to biological or physical resources or highly sensitive environments. Irreplaceable damage to highly sensitive cultural/social resources.	Noticeable, on-going natural and / or social benefits which have improved the overall conditions of the baseline.	<u>International</u> The effect will occur across international borders.	Permanent: The impact is irreversible, even with management, and will remain after the life of the project.	Definite: There are sound scientific reasons to expect that the impact will definitely occur. >80% probability.
6	Irreplaceable loss or damage to biological or physical resources or moderate to highly sensitive environments. Irreplaceable damage to cultural/social resources of moderate to highly sensitivity.	Great improvement to the overall conditions of a large percentage of the baseline.	<u>National</u> Will affect the entire country.	Beyond project life: The impact will remain for some time after the life of the project and is potentially irreversible even with management.	Almost certain / Highly probable: It is most likely that the impact will occur. <80% probability.

Rating	Intensity		Extent	Duration/Reversibility	Probability
	Negative Impacts (Nature = -1)	Positive Impacts (Nature = +1)			
5	Serious loss and/or damage to physical or biological resources or highly sensitive environments, limiting ecosystem function. Very serious widespread social impacts. Irreparable damage to highly valued items.	On-going and widespread benefits to local communities and natural features of the landscape.	<u>Province/ Region</u> Will affect the entire province or region.	Project Life (>15 years): The impact will cease after the operational life span of the project and can be reversed with sufficient management.	Likely: The impact may occur. <65% probability.
4	Serious loss and/or damage to physical or biological resources or moderately sensitive environments, limiting ecosystem function. On-going serious social issues. Significant damage to structures/ items of cultural significance.	Average to intense natural and / or social benefits to some elements of the baseline.	<u>Municipal Area</u> Will affect the whole municipal area.	Long term: 6-15 years and impact can be reversed with management.	Probable: Has occurred here or elsewhere and could therefore occur. <50% probability.

Rating	Intensity		Extent	Duration/Reversibility	Probability
	Negative Impacts (Nature = -1)	Positive Impacts (Nature = +1)			
3	Moderate loss and/or damage to biological or physical resources of low to moderately sensitive environments and, limiting ecosystem function. On-going social issues. Damage to items of cultural significance.	Average, on-going positive benefits, not widespread but felt by some elements of the baseline.	<u>Local</u> Local to the site and its immediate surroundings.	Medium term: 1-5 years and impact can be reversed with minimal management.	Unlikely: Has not happened yet but could happen once in the lifetime of the project, therefore there is a possibility that the impact will occur. <25% probability.
2	Minor loss and/or effects to biological or physical resources or low sensitive environments, not affecting ecosystem functioning. Minor medium-term social impacts on local population. Mostly repairable. Cultural functions and processes not affected.	Low positive impacts experience by a small percentage of the baseline.	<u>Limited</u> Limited extending only as far as the development site area.	Short term: Less than 1 year and is reversible.	Rare/ improbable: Conceivable, but only in extreme circumstances. The possibility of the impact materialising is very low as a result of design, historic experience or implementation of adequate mitigation measures. <10% probability.

Rating	Intensity		Extent	Duration/Reversibility	Probability
	Negative Impacts (Nature = -1)	Positive Impacts (Nature = +1)			
1	Minimal to no loss and/or effect to biological or physical resources, not affecting ecosystem functioning. Minimal social impacts, low-level repairable damage to commonplace structures.	Some low-level natural and / or social benefits felt by a very small percentage of the baseline.	<u>Very limited/Isolated</u> Limited to specific isolated parts of the site.	Immediate: Less than 1 month and is completely reversible without management.	Highly unlikely/ None: Expected never to happen. <1% probability.

Table 13-2: Probability/Consequence Matrix

		Significance																																						
		-147	-140	-133	-126	-119	-112	-105	-98	-91	-84	-77	-70	-63	-56	-49	-42	-35	-28	-21	21	28	35	42	49	56	63	70	77	84	91	98	105	112	119	126	133	140	147	
Probability	7	-126	-120	-114	-108	-102	-96	-90	-84	-78	-72	-66	-60	-54	-48	-42	-36	-30	-24	-18	18	24	30	36	42	48	54	60	66	72	78	84	90	96	102	108	114	120	126	
	6	-105	-100	-95	-90	-85	-80	-75	-70	-65	-60	-55	-50	-45	-40	-35	-30	-25	-20	-15	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	
	5	-84	-80	-76	-72	-68	-64	-60	-56	-52	-48	-44	-40	-36	-32	-28	-24	-20	-16	-12	12	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80	84	
	4	-63	-60	-57	-54	-51	-48	-45	-42	-39	-36	-33	-30	-27	-24	-21	-18	-15	-12	-9	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60	63	
	3	-42	-40	-38	-36	-34	-32	-30	-28	-26	-24	-22	-20	-18	-16	-14	-12	-10	-8	-6	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	
	2	-21	-20	-19	-18	-17	-16	-15	-14	-13	-12	-11	-10	-9	-8	-7	-6	-5	-4	-3	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	
	1																																							
		Consequence																																						
		-21	-20	-19	-18	-17	-16	-15	-14	-13	-12	-11	-10	-9	-8	-7	-6	-5	-4	-3	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	



Table 13-3: Significance Rating Description

Score	Description	Rating
109 to 147	A very beneficial impact that may be sufficient by itself to justify implementation of the project. The impact may result in permanent positive change	Major (positive) (+)
73 to 108	A beneficial impact which may help to justify the implementation of the project. These impacts would be considered by society as constituting a major and usually a long-term positive change to the (natural and / or social) environment	Moderate (positive) (+)
36 to 72	A positive impact. These impacts will usually result in positive medium to long-term effect on the natural and / or social environment	Minor (positive) (+)
3 to 35	A small positive impact. The impact will result in medium to short term effects on the natural and / or social environment	Negligible (positive) (+)
-3 to -35	An acceptable negative impact for which mitigation is desirable. The impact by itself is insufficient even in combination with other low impacts to prevent the development being approved. These impacts will result in negative medium to short term effects on the natural and / or social environment	Negligible (negative) (-)
-36 to -72	A minor negative impact requires mitigation. The impact is insufficient by itself to prevent the implementation of the project but which in conjunction with other impacts may prevent its implementation. These impacts will usually result in negative medium to long-term effect on the natural and / or social environment	Minor (negative) (-)
-73 to -108	A moderate negative impact may prevent the implementation of the project. These impacts would be considered as constituting a major and usually a long-term change to the (natural and / or social) environment and result in severe changes.	Moderate (negative) (-)
-109 to -147	A major negative impact may be sufficient by itself to prevent implementation of the project. The impact may result in permanent change. Very often these impacts are immitigable and usually result in very severe effects. The impacts are likely to be irreversible and/or irreplaceable.	Major (negative) (-)

13.1 The Positive and Negative Impacts that the Proposed Activity (In terms of the Initial Site Layout) and Alternatives will have on the Environment and the Community that may be affected

The impacts associated with the Construction and Decommissioning Phases of the proposed project are expected to be of low / minor significance. The impacts and risks of concern are related to potential hydrocarbon spillages from vehicles and machinery used. The hydrocarbon spillages may negatively impact on soils, surface water, aquatics and wetlands, as well as groundwater resources. Hydrocarbon spillages must be cleaned up immediately to prevent further contamination. Soils are likely to be impacted upon due to the pipeline and vehicles which can lead to soil erosion, although limited to a small spatial scale. Additionally soil stockpiles which will be created alongside the area where the pipeline will be constructed may be impacted during heavy rainfall events which can result in significant erosion and sedimentation of the water resources especially within a 100 metre buffer of the Klippoortjiespruit.

The area which will be impacted by the construction of the pipeline must be rehabilitated to ground level with no indentations. Should indentations occur this could lead to the creation of trenches through increased erosion. Vegetation establishment (where vegetation was previously cleared for the pipeline construction) will remain first priority once the pipeline has been constructed and rehabilitated. It should be noted however that along the road reserve most of the soil is compacted and no vegetation has been established. Therefore, where this is found it is recommended that once the pipeline has been constructed the soil is re-compacted, vegetation re-establishment is considered unnecessary in these areas.

Two moderate impacts / risks have been identified during the operational phase of the pipeline as water being transferred from the TWRP to Mballi Colliery is considered to be dirty water. Therefore should a leak in the pipeline occur, water qualities from the TWRP may exceed the Klippoortjiespruit Water Quality Objectives (WQO) which could potentially impact on the water quality within the Klippoortjiespruit. A negative impact on the water quality may impact the region's water resources, as well as inhibiting the ecological functioning of the wetlands. In the event of a burst pipe, an increased volume of water will be deposited downstream. This can potentially lead to increased erosion and potential impacts to downstream water users.

It is also noted that Mballi is currently experiencing contamination issues of the water course which runs through the operation. Elevated levels of TDS were recorded at three monitoring points. The surface water monitoring point, immediately upstream of the Mine, does not show elevated TDS. The TDS increases as the stream flows through the Mine. It is anticipated that the contamination is as a result of overflows from the slurry ponds or channel, or failure of the slurry ponds' or channel liners. The increased quantity of water from the pipeline being utilised in the coal wash plant and subsequently captured into Mballi's dirty water channels and PCD could potentially result in an overflow and further contamination of the stream. It should be noted that the PCD although able to contain the

increased quantity of water from the pipeline often silts up. Improved dirty water management measures needs to be undertaken to prevent this, and retains its capacity to sufficiently contain the increased volume of water onsite.

Mitigation measures have been proposed to address these identified impacts and therefore it is not anticipated that any moderate impacts associated with the pipeline will occur.

Positive impacts associated with the construction, operation and decommissioning of the pipeline have also been identified. It is anticipated that jobs will be created during both construction and decommissioning phases. However this impact is considered to be a minor positive as limited jobs will be created and the construction and decommissioning phases will not exceed four months. A more positive impact is associated with the operational phase through the creation of indirect jobs. Although no jobs will be created directly from the operation of the pipeline, it is anticipated that through the operation of the pipeline, Mbali's coal wash plant will continue to be operational. Additionally jobs created from the coal wash plant may even be preserved after Mbali Colliery reaches life of mine as it is anticipated that the plant will remain operational.

13.2 The Possible Mitigation Measures that could be applied and the Level of Risk

Mitigation measures for each identified impact have been proposed and are presented in Section 15.

13.3 Motivation where no Alternatives Sites were considered

Alternatives such as alternative route locations and alternative water sources have been investigated and discussed in Section 9. The most suitable alternatives have been selected based on this investigation to ensure the least environmental impact occurs.

13.4 Statement Motivating the Alternative Development Location within the Overall Site

Although various other route alternatives were investigated during the pre-application process only two routes as discussed below were investigated further due to the reduced impacts on the environment from the two selected routes.

Route A, has been selected as it is the shortest route to reduce the total amount of vegetation that is required to be cleared. The route has been selected as it crosses the least number of roads compared to other routes. The pipeline is proposed to be located within the road reserve as this area has already been impacted upon. The pipeline route has been selected to ensure that only one river, the Klippoortjiespruit, is crossed which is unavoidable.

Specialist studies have been undertaken to determine existing sensitivities along the proposed pipeline route and to determine the impact the pipeline will have on environmental aspects. It can be confirmed that no significant impacts will arise from the construction,

operation or decommissioning of the pipeline as long as mitigation measures are correctly implemented. Additionally, it can be confirmed that the preferred pipeline location is situated within a road reserve, is not located on any sensitive environmental features and an adequate distance away from human habitation to ensure that noise and dust will not affect neighbours during the construction phase. It can however be confirmed that the pipeline will be constructed over the Klippoortjiespruit.

14 Full Description of the Process undertaken to Identify, Assess and Rank the Impacts and Risks the Activity will impose on the Preferred Site (In respect of the Final Site Layout Plan) through the Life of the Activity

Alternatives were considered with regards to the location of the pipeline route which has been investigated in detail as described in Section 9. Stakeholders will be given the opportunity during the public review period to provide comment on the alternatives provided in this report. Should comments be received the alternative will be revised where applicable. The impacts and risks discussed in Section 12 are applicable to the final site layout plan (Plan 12 in Appendix B).

15 Assessment of each Identified Potentially Significant Impact and Risk

Table 15-1 provides all identified impacts associated with each phase and each aspect.

Table 15-1: Assessment of Each Identified Potentially Significant Impact

Phase	Activity	Aspect	Impact	Rating (Pre Mitigation)	Mitigation Measures	Rating (Post Mitigation)
Construction Phase	Proposed pipeline route selection and design	Flora & Wetlands	The location of pipeline infrastructure occurs either within the delineated freshwater feature areas or within the 32 m or 100 m zones of regulation according to NEMA and Regulation GN704 of the NWA.	Minor (negative) -	<ul style="list-style-type: none"> Ensure that as far as possible all infrastructures result in the least disturbance to delineated freshwater features present; Ensure that sound environmental management is in place during the planning phase as discussed in the site clearing, access and construction of berms impact for wetlands below; Design of infrastructure should be environmentally and structurally sound and all possible precautions taken to prevent spillage to the surface water resources present; and Impacts to surface wetlands are reduced as the proposed pipeline remains within the road reserves and attached to the existing bridge, as opposed to being trenched through water resources (the Klippoortjiespruit), thus minimizing additional fragmentation of the systems. 	Negligible (positive) +
Construction Phase	Construction of the Pipeline and associated clearance activities	Surface Water / Aquatic Ecology	Potential contamination of water from hydrocarbons, as a result of the construction vehicles utilised.	Minor (negative) -	<ul style="list-style-type: none"> Construction vehicles and machinery repairs must only take place in the designated workshop areas at the Mbali Colliery; Vehicles must be maintained according to their maintenance plans; Stationary vehicles should have a drip dray placed below the machine; Machinery and vehicles should be stored at Mbali Colliery when not in use. Extra precautions should be taken in areas within 500 meters of the Klippoortjiespruit to prevent any potential impact to the water course this includes effective stormwater control measures around soil stockpiles to prevent sedimentation of the river. 	Negligible (negative) -
Construction Phase	Site clearing, access and construction of berms	Flora & Wetlands	<p>Increased vehicular movement along river crossings and within wetland/riparian zones, resulting in:</p> <ul style="list-style-type: none"> Potential contamination of soils as a result of the ingress of hydrocarbons; Compaction of soils; Loss of natural vegetation; Increased sedimentation; and Increased potential for onset of erosion. 	Minor (negative) -	<ul style="list-style-type: none"> Ensure soil management programme is implemented and maintained to minimise erosion and sedimentation; During the construction phase, erosion berms should be installed on roadways and downstream of stockpiles to prevent gully formation and siltation of the freshwater resources. The following points should serve to guide the placement of erosion berms: <ul style="list-style-type: none"> Where the track has slope of less than 2%, berms every 50 m should be installed; Where the track slopes between 2% and 10%, berms every 25 m should be installed; Where the track slopes between 10%-15%, berms every 20 m should be installed; and Where the track has slope greater than 15%, berms every 10 m should be installed. Active rehabilitation, re-sloping, and re-vegetation of disturbed areas immediately after construction; Limit the footprint area of the construction activities to what is absolutely essential in order to minimise impacts as a result of vegetation clearing and 	Negligible (negative) -

Phase	Activity	Aspect	Impact	Rating (Pre Mitigation)	Mitigation Measures	Rating (Post Mitigation)
					compaction of soils (all areas but critically so in wetland areas); <ul style="list-style-type: none"> ▪ If it is absolutely unavoidable that any of the wetland areas present will be affected, disturbance must be minimised and suitably rehabilitated; ▪ Ensure that no incision and canalisation of the wetland features present takes place; ▪ All erosion noted within the construction footprint should be remedied immediately and included as part of an ongoing rehabilitation plan; ▪ Soils which were compacted as a result of construction activities should be ripped/scarified (<300 mm) and profiled; ▪ A suitable Alien Invasive Plant (AIP) control programme must be put in place so as to prevent further encroachment as a result of disturbance to the surrounding terrestrial zones; ▪ Permit only essential personnel within the 32 or 100 m zones of regulation for all freshwater features identified; ▪ No unnecessary crossing of the wetland features and their associated buffers should take place and the substrate conditions of the wetlands and downstream stream connectivity must be maintained; ▪ No material may be dumped or stockpiled within or within 500 metres of any rivers, tributaries or drainage lines in the vicinity of the proposed pipeline; ▪ No vehicles or heavy machinery may be allowed to drive indiscriminately within any wetland areas and their associated zones of regulation. All vehicles must remain on demarcated roads and within the construction footprint; ▪ All vehicles must be regularly inspected for leaks; ▪ Re-fueling must take place at the Mbali diesel facility, on a sealed surface area away from wetlands to prevent ingress of hydrocarbons into topsoil; ▪ All spills should be immediately cleaned up and treated accordingly; ▪ Wetlands should be monitored monthly during construction; and ▪ Appropriate sanitary facilities must be provided for the duration of the construction activities and all waste must be removed to an appropriate waste facility. 	
Construction Phase	Construction of the Pipeline and associated clearance activities	Soil, Land Use and Land Capability	During the pipeline construction, soil compaction, erosion and contamination are possible. The soil impacts may be a result of vegetation and topsoil removal for the pipeline, as well as compaction caused by vehicles and machinery onsite.	Minor (negative) -	<ul style="list-style-type: none"> ▪ The pipeline must be constructed in sections not exceeding 100m per section. A maximum of 4 sections may be active at the same time, by the undertaking of one of the following activities per section: ▪ Vegetation Clearance; ▪ Digging of the trench; ▪ Installation of the pipeline; or ▪ Backfilling of the trench and rehabilitation of the footprint. ▪ This means that no more than 400m of pipeline route will be affected at any given time, and concurrent rehabilitation of the pipeline footprint will be implemented. For example, the project will commence with vegetation clearance on Section 1. Once complete, vegetation clearance can continue to Section 2, while excavation of the trench can commence on Section 1. Once complete, vegetation clearance will continue to Section 3, with trench excavation continuing on Section 2, and pipe installation commencing on Section 1. Finally, Section 1 will be backfilled and rehabilitated, Pipe installation will be undertaken 	Negligible (negative) -

Phase	Activity	Aspect	Impact	Rating (Pre Mitigation)	Mitigation Measures	Rating (Post Mitigation)
					<p>in Section 2, Excavation of the trench will progress to Section 3 and vegetation clearance will progress to Section 4 of the pipeline route. Soil removed for the pipeline construction should be stockpiled and utilised as backfill once each section of pipeline has been constructed;</p> <ul style="list-style-type: none"> Soil removed for the pipeline construction should be stockpiled and utilised as backfill once each section of pipeline has been constructed; Soil should be deposited on top of the pipeline up to or above ground level so as to prevent trenches from developing which can result in increased erosion; Where the pipeline has been constructed within the road reserve and no vegetation is present, the area should be rehabilitated and soil compacted. No vegetation is required to be established within these areas; Suitable stormwater management measures must be implemented to prevent the loss of soil during rainfall events; All surfaces that are susceptible to erosion shall be covered with a suitable vegetative cover as soon as construction is completed. Rehabilitation to be monitored on an annual basis for three years on completion of the construction phase; Areas where vegetation is cleared (either for the pipeline where vegetation is present or for the laydown area), should be rehabilitated with a suitable vegetation cover once construction has been completed; The refueling of vehicles must take place either at Mbali Colliery or a petrol station; and Stockpiling of the pipes to be installed must be limited to only what is required and only be stored in designated areas to avoid any unnecessary soil compaction 	
Construction Phase	Construction of the Pipeline and associated clearance activities	Air Quality	Dust generated from site clearing, soil transportation, vehicle movement and the construction of the pipeline.	Minor (negative) -	<ul style="list-style-type: none"> The disturbed areas must be kept to a minimum and it is advised to not clear vegetation unnecessarily; and Water or a chemical dust suppressant should be used to dampen dust generating areas such as areas where soil has been exposed. 	Negligible (negative) -
Construction Phase	Construction of the Pipeline and associated clearance activities	Groundwater	Contamination of groundwater due to hydrocarbon spillages.	Negligible (negative) -	<ul style="list-style-type: none"> Construction vehicles and machinery repairs must only take place in the designated workshop areas at the Mbali Colliery; Vehicles must be maintained according to their maintenance plans; Stationary vehicles should have a drip tray placed below the machine; and Machinery and vehicles should be stored at Mbali Colliery when not in use. 	Negligible (negative) -
Construction Phase	Construction of the Pipeline and associated clearance activities	Social	Creation of jobs during the construction phase of the pipeline	Negligible (positive) +	<ul style="list-style-type: none"> Where feasible, promote the creation of employment opportunities for women and youth; Where possible, construction workers and other service providers will be recruited from the Ogies, Kendal, Kriel and surrounding areas to increase employment opportunities for directly affected and local communities; Establish a monitoring system to ensure that the subcontractors honour the specified local employment policy; and If required, the local resident status of applicants should be verified in consultation with community representatives and local government. 	Minor (positive) +

Phase	Activity	Aspect	Impact	Rating (Pre Mitigation)	Mitigation Measures	Rating (Post Mitigation)
Operational Phase	Operation of the pipeline	Surface Water / Aquatic Ecology	Surface water quality / quantity may be impacted upon should a leak occur in the pipeline as the water quality is not currently known. A sudden burst in the pipeline will result in a sudden increase of water into the surface water resources and can result in an impact on both water quality and quantity.	Minor (negative) -	<ul style="list-style-type: none"> Flow meters must be installed at either end of the pipeline to ensure that the same amount of water leaving TWRP, enters the Mbali Colliery; These reading should be taken on a daily basis and reported on monthly to HCI headquarters. Additionally these readings should be incorporated into the quarterly surface and groundwater monitoring report currently being undertaken for Mbali which is submitted to DWS; Comparisons between the volumes dispensed and received should be made to ensure no leaks in the pipeline have occurred; Should a variation be identified, further investigation must be undertaken to identify the location of the leak. Any leaks in the pipeline must be repaired immediately; and Surface water monitoring must be implemented at the locations identified in Part B Section 8.1.2. 	Negligible (negative) -
Operational Phase	Operation of the pipeline	Surface Water	The operation of the pipeline will result in an increased amount of water being utilised within the coal wash plant which could result in increased contaminated water run-off. This can lead to potential additional surface water contamination if not contained correctly.	Moderate (negative) -	<ul style="list-style-type: none"> Effective stormwater management must be implemented / improved on at the coal wash plant, PCD, and slurry ponds at Mbali to ensure that the increased amount of water to be discharged is contained in the PCD or slurry ponds and to prevent the siltation of these water containment facilities; The PCD and slurry pond are lined and are not expected to seep. This however needs to be confirmed and the integrity of the liner should be verified. A water balance will assist in achieving this and confirm if the liner is not leaking; All surface water pollution control structures will be inspected on a daily basis and maintenance work carried out as required. Furthermore, all structures (e.g. dams) registered in terms of the NWA will be maintained in accordance with the Act; All water management containment facilities must be maintained and is required to operate with a 0.8 m freeboard and able to contain a 1:100 year flood event; Additional surface water monitoring points should be incorporated into the Mbali Colliery water monitoring network to ensure no further contamination on surface water resources occur (Ref to Part B Section 8.1.2); and Should contamination be identified further investigation should be undertaken to identify the source of contamination and implement mitigation measures to prevent further contamination. 	Minor (negative) -
Operational Phase	Potential spills or leaks from pipeline infrastructure and resulting disturbance to soils	Flora & Wetlands	Among the impacts associated with the proposed project are potential impacts to soil and water quality as a result of the ingress of spills associated with the pipeline. Additionally alien invasive species are anticipated to impact on natural vegetation	Minor (negative) -	<ul style="list-style-type: none"> Leak detection will be necessary. Flow meters can be fitted at the start and end of the pipeline to detect if there are any water losses; All erosion noted within the operational footprint as a result of surface activities should be remedied immediately and included as part of the ongoing rehabilitation plan; Maintenance of erosion berms; A suitable AIP control programme must be put in place so as to prevent further encroachment as a result of disturbance to the surrounding terrestrial zones; Permit only essential personnel within the 32 or 100 m zones of regulation for all wetland features identified; No unnecessary crossing of the wetland features and their associated buffers should take place and the substrate conditions of the wetlands and downstream 	Negligible (negative) -

Phase	Activity	Aspect	Impact	Rating (Pre Mitigation)	Mitigation Measures	Rating (Post Mitigation)
					stream connectivity must be maintained; <ul style="list-style-type: none"> No material may be dumped or stockpiled within or within 500 metres of any rivers, tributaries or drainage lines in the vicinity of the proposed pipeline; All spills from maintenance vehicles or leaks from the pipeline should be immediately cleaned up and treated accordingly; and Monitor all systems for erosion and incision 	
Operational Phase	Operation of the pipeline	Soil, Land Use and Land Capability	Soil erosion due to loss of vegetation along the pipeline route	Minor (negative) -	<ul style="list-style-type: none"> Twice a year inspections of the pipeline route should be undertaken to ensure that soil erosion has not occurred along the pipeline route and Areas where erosion has occurred should be rehabilitated. 	Negligible (negative) -
Operational Phase	Operation of the pipeline	Social	Retention of jobs during the operational phase at the coal wash plant once LoM is reached at Mbali Colliery	Minor (positive) +	<ul style="list-style-type: none"> Empower the workforce to develop skills that could be transferred to other sectors of the economy; Training and skills development initiatives should be initiated; and Partner with existing community organisations and social departments to jointly assist affected communities, to strengthen the economic development opportunities provided as a result of the project. 	Minor (positive) +
Decommissioning Phase	Decommissioning and rehabilitation of the pipeline	Surface Water / Aquatic Ecology	Potential contamination of water from hydrocarbons, as a result of the vehicles utilised during decommissioning.	Minor (negative) -	<ul style="list-style-type: none"> Repairs on vehicles and machinery utilised during decommissioning and rehabilitation must only take place in the designated workshop areas at the Mbali Colliery; Vehicles must be maintained according to their maintenance plans; Stationary vehicles should have a drip tray placed below the machine; Machinery and vehicles should be stored at Mbali Colliery when not in use; Extra precautions should be taken in areas within 500 meters of the Klippoortjiespruit to prevent any potential impact to the water course this includes effective stormwater control measures around soil stockpiles to prevent sedimentation of the river. 	Negligible (negative) -
Decommissioning Phase	Decommissioning and rehabilitation of the pipeline	Soil, Land Use and Land Capability	The underlying soil will be compacted and susceptible to erosion. Topsoil will need replacement on the pipeline route. Hydrocarbon spillages from vehicles and machinery used during decommissioning could contaminate soil resources.	Minor (negative) -	<ul style="list-style-type: none"> Immediately clean up any hydrocarbon spills in accordance with the hydrocarbon SOP; Vehicles and machinery must be serviced in bunded areas at the Mbali Workshop; Suitable stormwater measures must be implemented to prevent the loss of soil to soil erosion; The pipeline should only be removed in sections. Once a certain area has been decommissioned and rehabilitated the next section can be removed to prevent further impact to soil; Soil should be stockpiled and utilised to rehabilitate the area once the pipeline has been removed. Soil should be deposited on top of the pipeline up to or above ground level so as to prevent trenches from developing which can result in increased erosion; Where the pipeline was placed within the road reserve and no vegetation is present. The area should be rehabilitated and soil compacted. No vegetation is required to be established within these areas; and Areas should be rehabilitated and vegetation allowed (where vegetation was 	Negligible (negative) -

Phase	Activity	Aspect	Impact	Rating (Pre Mitigation)	Mitigation Measures	Rating (Post Mitigation)
					previously cleared during decommissioning) to grow immediately after the pipeline has been removed;	
Decommissioning Phase	Site access roads and pipeline crossing wetlands, Removal of infrastructure and rehabilitation	Flora & Wetlands	<p>Increased vehicular movement along river crossings and within wetland/riparian zones, resulting in:</p> <ul style="list-style-type: none"> ▪ Potential contamination of soils as a result of the ingress of hydrocarbons; ▪ Loss of natural vegetation; ▪ Increased sedimentation; ▪ Increased potential for onset of erosion; ▪ Potential dumping of decommissioned infrastructure in wetland/riparian areas; and ▪ Potential incomplete removal of infrastructure. 	Minor (negative) -	<ul style="list-style-type: none"> ▪ Limit the footprint area of the decommissioning and rehabilitation activities to what is absolutely essential in order to minimise impacts as a result of vegetation clearing and compaction of soils (all areas but critically so in wetland areas); ▪ All erosion noted within the decommissioning area footprint should be remedied immediately and included as part of the ongoing rehabilitation plan; ▪ All soils compacted as a result of decommissioning activities should be ripped/scarified (<300 mm) and profiled; ▪ Permit only essential personnel within the zones of regulation for all freshwater features identified; ▪ Wherever possible, restrict decommissioning activities to the drier winter months to avoid sedimentation of the freshwater resources further downstream; ▪ No material may be dumped or stockpiled within any wetland areas (or the buffers) in the vicinity of the proposed decommissioning footprint; ▪ Wetlands and their associated zones of regulation are to be clearly demarcated and avoided wherever possible; ▪ An AIP management plan to be implemented and managed for the life of the proposed decommissioning, rehabilitation, closure and post-closure phases; ▪ As much vegetation growth as possible should be promoted within the proposed development area during all phases. In order to protect soils, vegetation clearance should be kept to a minimum; ▪ Monitor all systems for erosion and incision; ▪ All areas where active erosion is observed should be ripped, re-profiled and seeded with indigenous grasses; ▪ No vehicles or heavy machinery may be allowed to drive indiscriminately within any wetland areas and their associated zones of regulation. All vehicles must remain on demarcated roads and within the project area footprint; ▪ All vehicles must be regularly inspected for leaks; ▪ Re-fueling must take place at the Mbali diesel facility on a sealed surface area away from wetlands to prevent ingress of hydrocarbons into topsoil; ▪ All existing litter, debris should be removed from the wetland areas and littering should be prohibited on an ongoing basis; ▪ All spills from machinery should be immediately cleaned up and treated accordingly; ▪ Appropriate sanitary facilities must be provided for the duration of the rehabilitation activities and all waste must be removed to an appropriate waste facility; and ▪ Wetland monitoring should be carried out monthly during decommissioning and annually during rehabilitation; ▪ Ongoing wetland rehabilitation is necessary within and in the vicinity of the proposed decommissioning footprint and appropriate wetland monitoring techniques must take place on an annual basis during the summer/wet season in order to identify any emerging issues, trends or improvements in the receiving environment. 	Negligible (negative) -

Phase	Activity	Aspect	Impact	Rating (Pre Mitigation)	Mitigation Measures	Rating (Post Mitigation)
Decommissioning Phase	Decommissioning and rehabilitation of the pipeline	Air Quality	The extent of impacts depends on the extent of demolition and rehabilitation efforts during decommissioning. Impacts of this activity on the atmospheric environment will be similar to the impacts during the construction phase. The impacts will be short-term and localised.	Minor (negative) -	<ul style="list-style-type: none"> Vegetation establishment (where vegetation was previously cleared away) must take place on the bare soil to prevent soil erosion and dust creation; Exposed soil must be kept moist using sprays or water tanks to prevent dust creation before vegetation is established (where vegetation was previously cleared away); and Vegetation (where vegetation was previously cleared away) should be planted during the wet season to ensure vegetation establishment and prevent unnecessary costs. 	Negligible (negative) -
Decommissioning Phase	Decommissioning and rehabilitation of the pipeline	Groundwater	Contamination of groundwater due to hydrocarbon spillages from vehicles utilised during decommissioning activities.	Negligible (negative) -	<ul style="list-style-type: none"> Construction vehicles and machinery repairs must only take place in the designated workshop areas at the Mbali Colliery; Vehicles must be maintained according to their maintenance plans; Stationary vehicles should have a drip tray placed below the machine; and Machinery and vehicles should be stored at Mbali Colliery when not in use. 	Negligible (negative) -
Decommissioning Phase	Decommissioning and rehabilitation of the pipeline	Social	Creation of jobs during decommissioning and rehabilitation phase while the pipeline is being removed	Negligible (positive) +	<ul style="list-style-type: none"> Where feasible, promote the creation of employment opportunities for women and youth; Where possible, construction workers and other service providers will be recruited from the Ogies, Kendal, Kriel and surrounding areas to increase employment opportunities for directly affected and local communities; Establish a monitoring system to ensure that the subcontractors honour the specified local employment policy; and If required, the local resident status of applicants should be verified in consultation with community representatives and local government. 	Minor (positive) +

16 Summary of Specialist Reports

Table 16-1 provides a summary of the specialist studies that were undertaken for the proposed construction, operation and decommissioning of the pipeline.

Table 16-1: Specialist Studies that have been undertaken for the Project

List of studies undertaken	Recommendations of specialist reports	Specialist Recommendations that have been included in the EIA report	Reference to applicable section of report where specialist recommendations have been included
Heritage Specialist Study	The regional and local study areas are predominantly associated with burial grounds and graves, and the Historical Built Environment to a lesser extent. Within the development footprint, no heritage resources were identified, therefore no direct impacts to heritage resources are envisaged, and consequently no mitigation or management measures are proposed. It is, however, recommended that a Chance and Fossil Finds Procedure be developed and implemented as a condition of authorisation.	X - All recommendations have been considered and included in the BAR and EMP.	Mitigation and management measures included in this report were recommended by the Heritage Specialist, as well as the Chance Finds Procedures. This includes the impact assessment and mitigation measures as discussed in Section 12, as well as the recommendations provided in Part B Sections 5 and 6 and the monitoring provided in Section 8.

List of studies undertaken	Recommendations of specialist reports	Specialist Recommendations that have been included in the EIA report	Reference to applicable section of report where specialist recommendations have been included
Fauna and Wetlands Specialist Study	<p>Based on the findings of the baseline and sensitivity mapping assessment, a number of impacts were identified in relation to the wetland systems and floral habitats present. These impacts are deemed minor and negligible with the implementation of the proposed management and mitigation measures as the pipeline is proposed to run within the existing road servitude. Further impacts to the ecology of the wetlands and flora are thus deemed likely to be negligible with strict environmental management and mitigation measures in place.</p> <p>The following recommendations have been made:</p> <ul style="list-style-type: none"> ▪ Ensure soil management programme is implemented and maintained to minimise erosion and sedimentation; ▪ A suitable AIP control programme must be put in place so as to prevent further encroachment as a result of disturbance to the surrounding terrestrial zones; ▪ All erosion noted within the operational footprint as a result of surface activities should be remedied immediately and included as part of the ongoing rehabilitation plan; ▪ All areas where active erosion is observed should be ripped, re-profiled and seeded with indigenous grasses; and ▪ Wetland monitoring should be carried out monthly during construction and decommissioning and annually during the operational phase. 	X - All recommendations have been considered and included in the BAR and EMP.	Mitigation and management measures included in this report were recommended by the flora and wetland Specialist, as well as the monitoring programmes. This includes the impact assessment and mitigation measures as discussed in Section 12, as well as the recommendations provided in Part B Sections 5 and 6 and the monitoring provided in Section 8.

Note: Attach copies of specialist reports as appendices to this report

17 Environmental Impact Statement

17.1 Summary of the Key Findings of the Environmental Impact Assessment

The key findings from the construction, operation and decommissioning of the pipeline are associated with its impact on surface water and soil resources specifically the Klippoortjiespruit and the tributaries of the Klippoortjiespruit which runs through the Mbali colliery. The impacts associated with the construction and decommissioning phase is mostly due to the continuous movement of soil which can make it susceptible to erosion which could result in sedimentation of the rivers. Additionally while the pipeline is being constructed over the Klippoortjiespruit, impacts associated with the use of machinery can lead to contamination of the Klippoortjiespruit.

During the operational phase, the most significant impacts are associated with the potential risk of a pipeline leak which could result in the discharge of contaminated water into the environment.. The PCD at Mbali Colliery will need to contain the increased amount of water sufficiently to prevent further contamination on surface water resources. Mitigation measures have been proposed to ensure the PCD and slurry ponds are able to contain the water and prevent overflow.

17.2 Final Site Map

The infrastructure layout plan for the Project is provided in Plan 12 in Appendix B.

17.3 Summary of the Positive and Negative Implications and Risks of the Proposed Activity and Identified Alternatives

Table 17-1 identified all negative impacts associated with the Project during the construction, operation and decommissioning phase while Table 17-2 identified all positive impacts associated with the Project during the construction, operation and decommissioning phase.

Table 17-1: Summary of all negative impact for the Project

Phase	Activity	Aspect	Impact	Rating (pre mitigation)	Rating (post mitigation)
Construction Phase	Proposed pipeline route and design	Flora & Wetlands	The location of pipeline infrastructure occurs either within the delineated freshwater feature areas or within the 32 m or 100 m zones of regulation according to NEMA and Regulation GN704 of the NWA.	Minor (negative) -	Negligible (positive) +
Construction Phase	Construction of the Pipeline and associated clearance activities	Surface Water / Aquatic Ecology	Potential contamination of water from hydrocarbons, as a result of the construction vehicles utilised.	Minor (negative) -	Negligible (negative) -
Construction Phase	Site clearing and access and construction of berms	Flora & Wetlands	Increased vehicular movement along river crossings and within wetland/riparian zones, resulting in: <ul style="list-style-type: none"> ▪ Potential contamination of soils as a result of the ingress of hydrocarbons; ▪ Compaction of soils; ▪ Loss of natural vegetation; ▪ Increased sedimentation; and ▪ Increased potential for onset of erosion. 	Minor (negative) -	Negligible (negative) -
Construction Phase	Construction of the Pipeline and associated clearance activities	Soil, Land Use and Land Capability	During the pipeline construction, erosion and contamination are possible. The soil impacts may be a result of vegetation and topsoil removal for the pipeline, as well as compaction caused by vehicle and machinery onsite.	Minor (negative) -	Negligible (negative) -
Construction Phase	Construction of the Pipeline and associated clearance activities	Air Quality	Dust generated from site clearing, soil transportation, vehicle movement and the construction of the pipeline.	Minor (negative) -	Negligible (negative) -
Construction Phase	Construction of the Pipeline and associated clearance activities	Groundwater	Contamination of groundwater due to hydrocarbon spillages.	Negligible (negative) -	Negligible (negative) -
Operational Phase	Operation of the pipeline	Surface Water / Aquatic Ecology	Surface water quality / quantity may be impacted upon should a leak occur in the pipeline as the water quality is not currently known. A sudden burst in the pipeline will result in a sudden increase of water into the surface water resources and can result in an impact on both water quality and quantity.	Moderate (negative) -	Minor (negative) -
Operational Phase	Operation of the pipeline	Surface Water	The operation of the pipeline will result in an increased amount of water being utilised within the coal wash plant which could result in increased contaminated water run-off. This can lead to potential additional surface water contamination if not contained correctly.	Moderate (negative) -	Minor (negative) -
Operational Phase	Potential spills or leaks from pipeline infrastructure and resulting disturbance to soils	Flora & Wetlands	Among the impacts associated with the proposed project are potential impacts to soil and water quality as a result of the ingress of spills associated with the pipeline. Additionally alien invasive species are anticipated to impact on natural vegetation	Minor (negative) -	Negligible (negative) -

Phase	Activity	Aspect	Impact	Rating (pre mitigation)	Rating (post mitigation)
Operational Phase	Operation of the pipeline	Soil, Land Use and Land Capability	Soil erosion due to loss of vegetation along the pipeline route	Minor (negative) -	Negligible (negative) -
Decommissioning Phase ⁹	Decommissioning and rehabilitation of the pipeline	Surface Water / Aquatic Ecology	Potential contamination of water from hydrocarbons, as a result of the vehicles utilised during decommissioning.	Minor (negative) -	Negligible (negative) -
Decommissioning Phase	Decommissioning and rehabilitation of the pipeline	Soil, Land Use and Land Capability	The underlying soil will be susceptible to erosion. Topsoil will need replacement on the pipeline route. Hydrocarbon spillages from vehicles and machinery used during decommissioning could contaminate soil resources.	Minor (negative) -	Negligible (negative) -
Decommissioning Phase	Site access roads and pipeline crossing wetlands, Removal of infrastructure and rehabilitation	Flora & Wetlands	Increased vehicular movement along river crossings and within wetland/riparian zones, resulting in: <ul style="list-style-type: none"> ▪ Potential contamination of soils as a result of the ingress of hydrocarbons; ▪ Loss of natural vegetation; ▪ Increased sedimentation; ▪ Increased potential for onset of erosion; ▪ Potential dumping of decommissioned infrastructure in wetland/riparian areas; and ▪ Potential incomplete removal of infrastructure. 	Minor (negative) -	Negligible (negative) -
Decommissioning Phase	Decommissioning and rehabilitation of the pipeline	Air Quality	The extent of impacts depends on the extent of demolition and rehabilitation efforts during decommissioning. Impacts of this activity on the atmospheric environment will be similar to the impacts during the construction phase. The impacts will be short-term and localised.	Minor (negative) -	Negligible (negative) -
Decommissioning Phase	Decommissioning and rehabilitation of the pipeline	Groundwater	Contamination of groundwater due to hydrocarbon spillages from vehicles utilised during decommissioning activities.	Negligible (negative) -	Negligible (negative) -
Decommissioning Phase	Decommissioning and rehabilitation of the pipeline	Social	Creation of jobs during decommissioning and rehabilitation phase while the pipeline is being removed	Negligible (positive) +	Minor (positive) +

Table 17-2: Summary of all positive impact for the Project

Phase	Activity	Aspect	Impact	Rating (pre mitigation)	Rating (post mitigation)
Construction Phase	Construction of the Pipeline and associated clearance activities	Social	Creation of jobs during the construction phase of the pipeline	Negligible (positive) +	Minor (positive) +
Operational Phase	Operation of the pipeline	Social	Retainment of jobs during the operational phase at the coal wash plant once LoM is reached at Mbali Colliery	Minor (positive) +	Minor (positive) +

⁹ □ The Decommissioning and Rehabilitation Phase will see the removal of the pipeline and rehabilitation of the pipeline route. It should be noted that this phase will only be implemented should Mbali Colliery decide to remove the pipeline and rehabilitate the area. The decommissioning of the pipeline will require environmental authorisation in accordance with NEMA and therefore further impacts and mitigation measures will be proposed at the time of decommissioning planning. However, Mbali Colliery may decide, once the pipeline is no longer in use, to leave the pipeline in-situ which will prevent further disturbance to the environment. If this option is selected this phase will not be required.



Decommissioning Phase	Decommissioning and rehabilitation of the pipeline	Social	Creation of jobs during decommissioning and rehabilitation phase while the pipeline is being removed	Negligible (positive) +	Minor (positive) +
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18 Proposed Impact Management Objectives and the Impact Management Outcomes for Inclusion in the EMPR

The EMPR seeks to achieve a required end state and describes how activities that have, or could have, an adverse impact on the environment will be mitigated, controlled and monitored.

The EMPR will address the environmental impacts during the construction, operational and decommissioning phase of the proposed project. Due regard must be given to environmental protection during the entire project; a number of environmental recommendations are made to achieve environmental protection. These recommendations are aimed at ensuring that the contractor maintains adequate control over the proposed project to:

- Minimise the extent of an impact during the life of the proposed project;
- Ensure appropriate restoration of areas affected by the proposed project; and
- Prevent long term environmental degradation.

19 Aspects for Inclusion as Conditions of Authorisation

It is not foreseen that any additional aspects other than what has been included and discussed in this document, are required.

20 Description of any Assumptions, Uncertainties and Gaps in Knowledge

This section highlights the assumptions, uncertainties, limitations and knowledge gaps relevant to the various specialist studies undertaken.

20.1 Basic Assessment Report

The following assumptions were made to complete the BAR:

- As no detail engineering designs were available at the time of the BAR compilation it was assumed the proposed pipeline route is approximately 3.6 - 4 km in length with a diameter of 0.25 – 0.35 metres (m). The required servitude for construction of the pipeline is 5 m. Therefore the total area which the pipeline is proposed to cover is 1.8 - 2 ha and therefore the assessment covers an area of 2 ha;
- It is assumed that raw water will be transported between the TWRP and Mbali Colliery. However, the agreement between Glencore and HCI Coal has not been finalised and therefore depending on the quality of the raw water, Mbali Colliery may require treated water which will reduce the impact associated with operation of the pipeline; and
- It is assumed that the pipeline will be constructed within the road reserve and where road crossings are required will be constructed beneath the road via pipe-jacking,

however this can only be confirmed once an agreement with SANRAL has been established.

20.2 Fauna and Wetland Specialist Study

The following limitations were encountered during this study:

- Wetlands have been delineated only within the 500 m area of the proposed pipeline route;
- Overgrazing, trampling, and cultivation in some areas made identification of species impossible. As a result, the species richness will be underestimated;
- The composition of the flora and freshwater resources in the Project area prior to major disturbance is unknown. For this reason, reference conditions are hypothetical, and are based on professional judgement and/or inferred from limited data available; and
- With ecology being dynamic and complex, certain aspects, some of which may be important, may have been overlooked. However, wherever possible, it is expected that the Project area has been accurately assessed and considered, based on the field observations undertaken and the consideration of historical and existing studies and the desktop data available.

20.3 Heritage Specialist Study

The following limitations and constraints were experienced in the compilation of the heritage specialist report:

- Whilst every attempt to obtain the latest available information was made, the reviewed literature does not represent an exhaustive list of information sources for the various study areas;
- Palaeontological and archaeological resources commonly occur at subsurface levels and so these resources may not be adequately recorded or documented by assessors without the use of destructive and intrusive methodologies. The reviewed literature and results of the field survey are therefore limited to surface observations; and
- This report was compiled prior to the regulated public review period. This report therefore does not consider the results of consultation as required by Section 38(3)(e) of the NHRA.

21 Reasoned Opinion as to whether the proposed Activity should or should not be authorised

21.1 Reasons why the Activity should be authorised or not

The Mbali Colliery supplies coal to the local markets which assists with economic growth and development. The mine operates as an open cast operation and utilises a wash plant. As the colliery is currently experiencing water shortages this wash plant can no longer operate optimally due to the limited water available within the pits and PCD. The proposed construction and operation of the pipeline between TWRP and Mbali Colliery will assist in providing water to the coal wash plant. This will ensure the continuation of the mining operation in its current state. Once Mbali Colliery reaches LoM it will lead to a downgrade of the economic wealth within the local community from the mining operation. It is therefore proposed that once Mbali Colliery is decommissioned, HCI Coal will source coal from other operations and process coal in the existing plant at Mbali. Therefore the pipeline and coal wash plant will remain in operation even after the mine ceases mining operation and is rehabilitated. This will assist in lessening the impacts associated with the decommissioning of the Mbali Colliery.

Additionally Mbali Colliery currently provides the local market with a total of 89 direct job opportunities. Of this a total of 41 Employees are in the Engineering Department, 27 employees are employed as office staff and 21 employees are directly involved in the operation of the coal wash plant. The construction and operation of the pipeline to supply water to the coal wash plant and ensure its continued operation will ensure the prevention of job losses associated with plant decommissioning. In addition to the employment provided by Mbali Coal Directly, their mining contractor, Diesel Power, employs 178 people.

The construction and operation of the pipeline to ensure that water is fed to the coal wash plant will ensure the preservation of these jobs created from the continued operation of the Mbali Colliery.

It should also be considered that during the construction phase it is anticipated that 8 jobs will be created over a period of four months which will have a short term positive impact on the social environment. No jobs are however anticipated to be created once the pipeline becomes operational as the operation of the pipeline is not labour intensive.

21.2 Conditions that must be included in the Authorisation

The following conditions must be included and approved for the EMPR:

21.2.1 Construction and Decommissioning Conditions

- Monitoring to be undertaken during the construction / decommissioning phase of the pipeline must be completed daily by the internal Environmental Control Officer (ECO) appointed at Mbali and monthly by an external independent ECO;

- Construction vehicles and machinery repairs must only take place in the designated workshop areas at the Mbali Colliery. Vehicles must be maintained according to their maintenance plans;
- Extra precautions should be taken in areas within 500 meters of the Klippoortjiespruit to prevent any potential impact to the water course, which includes effective stormwater control measures around soil stockpiles to prevent sedimentation of the river;
- Establish Project-specific Chance and Fossil Find Protocols and Procedures (CFPs) as a condition of authorisation;
- The pipeline must be constructed in sections not exceeding 100m per section. A maximum of 4 sections may be active at the same time, by the undertaking of one of the following activities per section:
 - Vegetation Clearance;
 - Digging of the trench;
 - Installation of the pipeline; or
 - Backfilling of the trench and rehabilitation of the footprint.

This means that no more than 400m of pipeline route will be affected at any given time, and concurrent rehabilitation of the pipeline footprint will be implemented. For example, the project will commence with vegetation clearance on Section 1. Once complete, vegetation clearance can continue to Section 2, while excavation of the trench can commence on Section 1. Once complete, vegetation clearance will continue to Section 3, with trench excavation continuing on Section 2, and pipe installation commencing on Section 1. Finally, Section 1 will be backfilled and rehabilitated, Pipe installation will be undertaken in Section 2, Excavation of the trench will progress to Section 3 and vegetation clearance will progress to Section 4 of the pipeline route. Soil removed for the pipeline construction should be stockpiled and utilised as backfill once each section of pipeline has been constructed;

- Soil removed for the pipeline construction should be stockpiled and utilised as backfill once each section of pipeline has been constructed;
- Soil should be deposited on top of the pipeline up to or above ground level so as to prevent trenches from developing which can result in increased erosion;
- Ensure soil management programme is implemented and maintained to minimise erosion and sedimentation;
- During the construction phase, erosion berms should be installed on roadways and downstream of stockpiles to prevent gully formation and siltation of the freshwater resources. The following points should serve to guide the placement of erosion berms:



- Where the track has slope of less than 2%, berms every 50 m should be installed;
 - Where the track slopes between 2% and 10%, berms every 25 m should be installed;
 - Where the track slopes between 10%-15%, berms every 20 m should be installed; and
 - Where the track has slope greater than 15%, berms every 10 m should be installed.
- Suitable stormwater measures around the areas where the pipeline is being constructed must be implemented to prevent the loss of soil to soil erosion;
 - All surfaces that are susceptible to erosion shall be covered with a suitable vegetative cover as soon as construction / decommissioning is completed. Rehabilitation monitoring must be undertaken on an annual basis for three years on completion of the construction phase and for three years once the decommissioning phase has been completed.
 - Limit the footprint area of the construction activities to what is absolutely essential in order to minimise impacts as a result of vegetation clearing and compaction of soils (all areas but critically so in wetland areas);
 - No material may be dumped or stockpiled within or within 500 metres of any rivers, tributaries or drainage lines in the vicinity of the proposed pipeline;
 - A suitable AIP control programme must be put in place so as to prevent further encroachment as a result of disturbance to the surrounding terrestrial zones;
 - Wetland monitoring should be carried out monthly during construction and decommissioning and annually during rehabilitation;
 - Ongoing wetland rehabilitation is necessary within and in the vicinity of the proposed construction and decommissioning footprint and appropriate wetland monitoring techniques must take place on an annual basis during the summer/wet season in order to identify any emerging issues, trends or improvements in the receiving environment.
 - The refuelling of vehicles must take place either at Mbali Colliery or a petrol station; and
 - Water should be used to dampen dust generating areas, or a chemical dust suppressant, such as the exposed soil where the pipeline will be constructed;

21.2.2 Operational Phase Conditions

- Daily readings of water leaving TWRP and entering Mbali must be taken and reported on monthly to HCI headquarters. Additionally these readings should be incorporated into the quarterly surface and groundwater monitoring report currently



being undertaken for Mbali which is submitted to DWS. The volumes dispensed and received should be compared to ensure no leaks in the pipeline have occurred. Should a variation be identified, further investigation must be undertaken to identify the location of the leak. Any leaks in the pipeline must be repaired immediately;

- Effective stormwater management must be implemented / improved on at the coal wash plant, PCD, and slurry ponds at Mbali to ensure that the increased amount of water to be discharged is contained in the PCD or slurry ponds and to prevent the siltation of these water containment facilities;
- The PCD and slurry pond are lined and are not expected to seep. This however needs to be confirmed and the integrity of the liner should be verified. A water balance will assist in achieving this and confirm if the liner is not leaking;
- All surface water pollution control structures will be inspected on a weekly basis and maintenance work carried out as required. Furthermore, all structures (e.g. dams) registered in terms of the NWA will be maintained in accordance with the Act;
- All water management containment facilities must be maintained and is required to operate with a 0.8 m freeboard and able to contain a 1:100 year flood event;
- A suitable AIP control programme must be put in place so as to prevent further encroachment as a result of disturbance to the surrounding terrestrial zones;
- Permit only essential personnel within the 32 or 100 m zones of regulation for all wetland features identified;
- No unnecessary crossing of the wetland features and their associated buffers should take place and the substrate conditions of the wetlands and downstream stream connectivity must be maintained;
- No material may be dumped or stockpiled within or within 500 metres of any rivers, tributaries or drainage lines in the vicinity of the proposed pipeline;
- All spills from maintenance vehicles or leaks from the pipeline should be immediately cleaned up and treated accordingly;
- Additional surface water monitoring points should be incorporated into the Mbali Colliery water monitoring network to ensure no further contamination on surface water resources occur (Ref to Part B Section 8.1.2) and Should contamination be identified further investigation should be undertaken to identify the source of contamination and implement mitigation measures to prevent further contamination;
- Twice a year inspections of the pipeline route should be undertaken to ensure that soil erosion has not occurred along the pipeline route. Should areas be identified where erosion has occurred these areas should be rehabilitated.

22 Period for which the Environmental Authorisation is required

It is proposed that the pipeline will be constructed within four months however a contingency has been provided should delays be experienced (due to economic circumstances, adverse weather conditions or other unforeseen circumstances). Therefore the authorisation to complete the construction phase should be valid for twelve months. It is unknown how long the pipeline will operate for therefore authorisation for the operation of the pipeline should be authorised indefinitely until the pipeline is no longer required and is decommissioned.

23 Undertaking

Please refer to Part B, Section 12 for the complete undertaking applicable to the EIA and EMP sections of this report.

24 Financial Provision

HCI Coal proposes to obtain environmental authorisation for the proposed construction, operation and decommissioning of the pipeline to transfer water from the TWRP to the Mballi Colliery. Therefore the basic assessment process has assessed and provided mitigation measures for the decommissioning and rehabilitation of the pipeline however no separate closure plan or financial provision for the pipeline will be compiled as this will be included as part of the Mballi Colliery closure plan which is updated on an annual basis.

24.1 Explain how the aforesaid Amount was derived

This section is considered to be not applicable.

24.2 Confirm that this Amount can be provided for from Operating Expenditure

This section is considered to be not applicable.

25 Specific Information required by the competent Authority

Compliance with the provisions of sections 24(4) (a) and (b) read with section 24 (3) (a) and (7) of the NEMA and the BAR report must include the:-

25.1 Impact on the Socio-Economic Conditions of any Directly Affected Person

A number of positive social impacts associated with the project have been identified and summarised below:

- Creation of jobs during the construction phase of the pipeline;
- Continue the operation of the Mballi Colliery resulting in jobs already created from the mining operation being retained;

- Continuation of jobs during the operational phase at the coal wash plant once LoM is reached at Mbali Colliery; and
- Creation of jobs during decommissioning and rehabilitation phase while the pipeline is being removed.

25.2 Impact on any National Estate referred to in Section 3(2) of the National Heritage Resources Act.

A Heritage BAR was compiled and submitted to the SAHRA and the Heritage Resource Authority of Mpumalanga. No heritage resources were identified within the proposed development footprint. To this effect, no direct impacts to heritage resources are envisaged. The pipeline is underlain by palaeontologically sensitive layers. However, it is unlikely that any impact to these layers should arise due to the limited depth of pipeline construction (to be confirmed with finalisation of detailed engineering designs, but no more than 1m). A Chance Finds procedure for heritage and fossil resources will be implemented during the construction phase to ensure the national estate is not impacted, in the event that unknown heritage resources are uncovered during construction.

26 Other matters required in terms of Sections 24(4)(a) and (b) of the Act

Section 24(4)(b)(i) of the NEMA (as amended), provides that an investigation must be undertaken of the potential consequences or impacts of the alternatives to the activity on the environment and assessment of the significance of those potential consequences or impacts, including the option of not implementing the activity. The outcome of the investigation has been provided in Section 7 to Section 13.1 Part A of this Basic Assessment Report.

Part B: Environmental Management Programme Report

1 Details of the EAP

Digby Wells and Associates (South Africa) (Pty) Ltd (trading as Digby Wells Environmental – hereafter Digby Wells) has been appointed as the independent Environmental Assessment Practitioner (EAP) to undertake the EIA process. The details of the EAP are provided in below.

Table 1-1: Contact Details of the EAP

Name of Practitioner:	Mr Mel Pillay
Telephone:	011 789 9495
Fax:	011 069 6801
Postal Address	Private Bag X10046, Randburg, 2125, South Africa
Email:	mel.pillay@digbywells.com

2 Description of the aspects of the activity

A summary of the baseline environment in the proposed project area is provided in Part A: Section 11. It should be noted that the following specialist studies have been undertaken for the proposed project:

- Heritage Specialist Assessment (Appendix D); and
- Flora and Wetland Specialist Assessment (Appendix E).

Additional information has been sourced from previous specialist studies undertaken for Mbali Colliery and in the surrounding areas.

3 Composite Map

The composite plan for the project area, indicating sensitive areas, heritage resources watercourse buffers, is included as Plan 13 in Appendix B.

4 Description of Impact Management Objectives including Management Statements

4.1 Determination of Closure Objectives

Closure and rehabilitation is a continuous series of activities that begin with planning prior to the project's design and construction, and end with achievement of long-term site stability and the establishment of a self-sustaining ecosystem. Not only will the implementation of this concept result in a more satisfactory environmental conclusion, but it will also reduce the financial burden of closure and rehabilitation.

The following points outline the main objectives for rehabilitation and closure:

- Achieve a final land use where no evidence of the pipeline is identified, and that is sustainable and meets both legislative requirements and stakeholder needs.
- Maintain and monitor all rehabilitated areas following re-vegetation;
- Comply with local, district and national regulatory requirements; and
- Follow a comprehensive consultation and communication process with all stakeholders.

Rehabilitation and closure objectives have been tailored to the project at hand. It must be noted that HCI Coal proposes to obtain environmental authorisation for the proposed construction, operation and decommissioning of the pipeline to transfer water from the TWRP to the Mbali Colliery. Therefore the basic assessment process has assessed and provided mitigation measures for the decommissioning and rehabilitation of the pipeline however no separate closure plan or financial provision for the pipeline will be compiled as this will be included as part of the Mbali Colliery closure plan which is updated on an annual basis.

4.2 Volumes and Rate of Water Use required for the Operation

Currently the Mbali wash plant uses 1,500m³ of water per day. A total of 2,000m³ of water per day will be made available if the pipeline is approved. Therefore, a total volume of 2,000m³ per day at a rate of 18 litres per second is required at the coal wash plant.

4.3 Has a Water Use Licence has been applied for

Mbali Colliery is in possession of an Integrated Water Use Licence (IWUL) issued by the Department of Water Affairs (DWA) on the 4th of June in 2012 (license no: 04/B11F/ACGIJ/1755).

The Construction of infrastructure within 100 meters of a River or within 500 meters of a wetland requires a license under Section 40 of the NWA. The pipeline will be constructed across the Klippoortjiespruit therefore a WUL will be applied for in terms of Section 21 c and i in accordance with NWA.

5 Impacts to be Mitigated in their Respective Phases and Management Outcomes

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

Activity	Phase	Aspect	Size and scale of disturbance	Mitigation Measures	Compliance with standards	Time period for implementation
Proposed pipeline route and design	Construction Phase	Flora & Wetlands	2 ha Local Scale	<ul style="list-style-type: none"> Ensure that as far as possible all infrastructures result in the least disturbance to delineated freshwater features present; Ensure that sound environmental management is in place during the planning phase as discussed in the site clearing, access and construction of berms impact for wetlands below; Design of infrastructure should be environmentally and structurally sound and all possible precautions taken to prevent spillage to the surface water resources present; and Impacts to surface wetlands are reduced as the proposed pipeline remains within the road reserves and attached to the existing bridge, as opposed to being trenched through water resources (the Klippoortjiespruit), thus minimizing additional fragmentation of the systems. 	<ul style="list-style-type: none"> The NWA Section 21 (c), (g) and (i) of the NWA Section 24 of the Constitution NEM:BA NEMA Department of Water and Forestry (DWAF) guidelines for the delineation of wetlands (2005); Mining and Biodiversity Guideline (DEA et al., 2013); MTPB, 2014 	Planning and Pre-Construction Phase
Construction of the Pipeline and associated clearance activities	Construction Phase	Surface Water / Aquatic Ecology	Local Scale (5 km radius)	<ul style="list-style-type: none"> Construction vehicles and machinery repairs must only take place in the designated workshop areas at the Mbali Colliery; Vehicles must be maintained according to their maintenance plans; Stationary vehicles should have a drip dray placed below the machine; Machinery and vehicles should be stored at Mbali Colliery when not in use; and Extra precautions should be taken in areas within 500 meters of the Klippoortjiespruit to prevent any potential impact to the water course this includes effective stormwater control measures around soil stockpiles to prevent sedimentation of the river. 	<ul style="list-style-type: none"> Based on the GN 704 requirements regarding stormwater management for mining activities it is noted that all clean and dirty water must be separated. 	Construction Phase
Site clearing, access and construction of berms	Construction Phase	Flora & Wetlands	2 ha Local Scale	<ul style="list-style-type: none"> Ensure soil management programme is implemented and maintained to minimise erosion and sedimentation; During the construction phase, erosion berms should be installed on roadways and downstream of stockpiles to prevent gully formation and siltation of the freshwater resources. The following points should serve to guide the placement of erosion berms: 	<ul style="list-style-type: none"> The NWA Section 21 (c), (g) and (i) of the NWA Section 24 of the Constitution NEM:BA NEMA Department of Water and Forestry (DWAF) guidelines for the delineation of wetlands (2005); 	Construction Phase



Activity	Phase	Aspect	Size and scale of disturbance	Mitigation Measures	Compliance with standards	Time period for implementation
				<ul style="list-style-type: none"> ▪ Where the track has slope of less than 2%, berms every 50 m should be installed; ▪ Where the track slopes between 2% and 10%, berms every 25 m should be installed; ▪ Where the track slopes between 10%-15%, berms every 20 m should be installed; and ▪ Where the track has slope greater than 15%, berms every 10 m should be installed. ▪ Active rehabilitation, re-sloping, and re-vegetation of disturbed areas immediately after construction; ▪ Limit the footprint area of the construction activities to what is absolutely essential in order to minimise impacts as a result of vegetation clearing and compaction of soils (all areas but critically so in wetland areas); ▪ If it is absolutely unavoidable that any of the wetland areas present will be affected, disturbance must be minimised and suitably rehabilitated; ▪ Ensure that no incision and canalisation of the wetland features present takes place; ▪ All erosion noted within the construction footprint should be remedied immediately and included as part of an ongoing rehabilitation plan; ▪ Soils which were compacted as a result of construction activities should be ripped/scarified (<300 mm) and profiled; ▪ A suitable Alien Invasive Plant (AIP) control programme must be put in place so as to prevent further encroachment as a result of disturbance to the surrounding terrestrial zones; ▪ Permit only essential personnel within the 32 or 100 m zones of regulation for all freshwater features identified; ▪ No unnecessary crossing of the wetland features and their associated buffers should take place and the substrate conditions of the wetlands and downstream stream connectivity must be maintained; ▪ No material may be dumped or stockpiled within or within 500 metres of any rivers, tributaries or drainage lines in the vicinity of the proposed pipeline; ▪ No vehicles or heavy machinery may be allowed to drive indiscriminately within any wetland areas and 	<ul style="list-style-type: none"> ▪ Mining and Biodiversity Guideline (DEA et al., 2013); ▪ MTPB, 2014 	

Activity	Phase	Aspect	Size and scale of disturbance	Mitigation Measures	Compliance with standards	Time period for implementation
				<p>their associated zones of regulation. All vehicles must remain on demarcated roads and within the construction footprint;</p> <ul style="list-style-type: none"> ▪ All vehicles must be regularly inspected for leaks; ▪ Re-fueling must take place at the Mbali diesel facility, on a sealed surface area away from wetlands to prevent ingress of hydrocarbons into topsoil; ▪ All spills should be immediately cleaned up and treated accordingly; ▪ Wetlands should be monitored monthly during construction; and ▪ Appropriate sanitary facilities must be provided for the duration of the construction activities and all waste must be removed to an appropriate waste facility. 		
<p>Construction of the Pipeline and associated clearance activities</p>	<p>Construction Phase</p>	<p>Soil, Land Use and Land Capability</p>	<p>2 ha Local Scale</p>	<ul style="list-style-type: none"> ▪ The pipeline must be constructed in sections not exceeding 100m per section. A maximum of 4 sections may be active at the same time, by the undertaking of one of the following activities per section: <ul style="list-style-type: none"> ▪ Vegetation Clearance; ▪ Digging of the trench; ▪ Installation of the pipeline; or ▪ Backfilling of the trench and rehabilitation of the footprint. <p>This means that no more than 400m of pipeline route will be affected at any given time, and concurrent rehabilitation of the pipeline footprint will be implemented. For example, the project will commence with vegetation clearance on Section 1. Once complete, vegetation clearance can continue to Section 2, while excavation of the trench can commence on Section 1. Once complete, vegetation clearance will continue to Section 3, with trench excavation continuing on Section 2, and pipe installation commencing on Section 1. Finally, Section 1 will be backfilled and rehabilitated, Pipe installation will be undertaken in Section 2, Excavation of the trench will progress to Section 3 and vegetation clearance will progress to Section 4 of the pipeline route. Soil removed for the pipeline construction should be stockpiled and utilised as backfill once each section of pipeline has been</p>	<ul style="list-style-type: none"> ▪ Chamber of Mines Guidelines ▪ CARA 	<p>Construction Phase</p>

Activity	Phase	Aspect	Size and scale of disturbance	Mitigation Measures	Compliance with standards	Time period for implementation
				<p>constructed;</p> <ul style="list-style-type: none"> ▪ Soil removed for the pipeline construction should be stockpiled and utilised as backfill once each section of pipeline has been constructed; ▪ Soil should be deposited on top of the pipeline up to or above ground level so as to prevent trenches from developing which can result in increased erosion; ▪ Where the pipeline has been constructed within the road reserve and no vegetation is present, the area should be rehabilitated and soil compacted. No vegetation is required to be established within these areas; ▪ Suitable stormwater management measures must be implemented to prevent the loss of soil during rainfall events; ▪ All surfaces that are susceptible to erosion shall be covered with a suitable vegetative cover as soon as construction is completed. ▪ Rehabilitation to be monitored on an annual basis for three years on completion of the construction phase; ▪ Areas where vegetation is cleared (either for the pipeline where vegetation is present or for the laydown area), should be rehabilitated with a suitable vegetation cover once construction has been completed; ▪ The refueling of vehicles must take place either at Mbali Colliery or a petrol station; and ▪ Stockpiling of the pipes to be installed must be limited to only what is required and only be stored in designated areas to avoid any unnecessary soil compaction 		
Construction of the Pipeline and associated clearance activities	Construction Phase	Air Quality	Local Scale	<ul style="list-style-type: none"> ▪ The disturbed areas must be kept to a minimum and it is advised to not clear vegetation unnecessarily; and ▪ Water or a chemical dust suppressant should be used to dampen dust generating areas such as areas where soil has been exposed. 	<ul style="list-style-type: none"> ▪ National Environmental Management: Air Quality Act, Act.39 of 2004 standards 2009; ▪ National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) - National Dust Control Regulations (2013). ▪ Act, 2004 (Act No. 39 of 2004) – National Ambient Air 	Construction Phase

Activity	Phase	Aspect	Size and scale of disturbance	Mitigation Measures	Compliance with standards	Time period for implementation
					Quality Standard for Particulate Matter with Aerodynamic Diameter less than 2.5 Microns Meters (PM 2.5) 2012	
Construction of the Pipeline and associated clearance activities	Construction Phase	Groundwater	Local Scale (5 km radius)	<ul style="list-style-type: none"> Construction vehicles and machinery repairs must only take place in the designated workshop areas at the Mbali Colliery; Vehicles must be maintained according to their maintenance plans; Stationary vehicles should have a drip tray placed below the machine; and Machinery and vehicles should be stored at Mbali Colliery when not in use. 	<ul style="list-style-type: none"> SANS River quality objectives. South African water quality guidelines for drinking, irrigation and livestock watering. 	Construction Phase
Construction of the Pipeline and associated clearance activities	Construction Phase	Social	Local Scale	<ul style="list-style-type: none"> Where feasible, promote the creation of employment opportunities for women and youth; Where possible, construction workers and other service providers will be recruited from the Ogies, Kendal, Kriel and surrounding areas to increase employment opportunities for directly affected and local communities; Establish a monitoring system to ensure that the subcontractors honour the specified local employment policy; and If required, the local resident status of applicants should be verified in consultation with community representatives and local government. 	<ul style="list-style-type: none"> Mineral and Petroleum Resource Development Act (Act of 2002); Mine Health and Safety Act (Act of 1996); Occupational Health and Safety, 1993 (Act no. 85 of 1993) (OHS); International Human Rights Guiding Principles; IFC PS 4: Community Health, Safety and Security; and National Environmental Management Act (Act of 1998). 	Construction Phase
Construction of the Pipeline and associated clearance activities	Construction Phase	Heritage	2 ha Local Scale	<ul style="list-style-type: none"> Establish Project-specific Chance and Fossil Find Protocols and Procedures (CFPs) as a condition of authorisation 	<ul style="list-style-type: none"> The National Heritage Resources Act, 1999 (Act No. 25 of 1999) Regulations to the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (GN R 548) (SAHRA Regulations) SAHRA Minimum Standards: Archaeological and Paleontological Components of Impact Assessment Reports 	Construction Phase
Operation of the pipeline	Operational Phase	Surface	Local Scale (5 km	<ul style="list-style-type: none"> Flow meters must be installed at either end of the 	<ul style="list-style-type: none"> Based on the GN 704 	Operational Phase

Activity	Phase	Aspect	Size and scale of disturbance	Mitigation Measures	Compliance with standards	Time period for implementation
		Water / Aquatic Ecology	radius)	<p>pipeline to ensure that the same amount of water leaving TWRP, enters the Mbali Colliery;</p> <ul style="list-style-type: none"> These reading should be taken on a daily basis and reported on monthly to HCI headquarters. Additionally these readings should be incorporated into the quarterly surface and groundwater monitoring report currently being undertaken for Mbali which is submitted to DWS; Comparisons between the volumes dispensed and received should be made to ensure no leaks in the pipeline have occurred; Should a variation be identified, further investigation must be undertaken to identify the location of the leak. Any leaks in the pipeline must be repaired immediately; and Surface water monitoring must be implemented at the locations identified in Part B Section 8.1.2. 	<p>requirements regarding stormwater management for mining activities it is noted that all clean and dirty water must be separated.</p> <ul style="list-style-type: none"> The National Water Act (NWA), 1998 (Act No. 36 of 1998) 	
Operation of the pipeline	Operational Phase	Surface Water	Regional Scale (10 km radius)	<ul style="list-style-type: none"> Effective stormwater management must be implemented / improved on at the coal wash plant, PCD, and slurry ponds at Mbali to ensure that the increased amount of water to be discharged is contained in the PCD or slurry ponds and to prevent the siltation of these water containment facilities; The PCD and slurry pond are lined and are not expected to seep. This however needs to be confirmed and the integrity of the liner should be verified. A water balance will assist in achieving this and confirm if the liner is not leaking; All surface water pollution control structures will be inspected on a weekly basis and maintenance work carried out as required. Furthermore, all structures (e.g. dams) registered in terms of the NWA will be maintained in accordance with the Act; All water management containment facilities must be maintained and is required to operate with a 0.8 m freeboard and able to contain a 1:100 year flood event; Additional surface water monitoring points should be incorporated into the Mbali Colliery water monitoring network to ensure no further contamination on surface water resources occur; and Should contamination be identified further 	<ul style="list-style-type: none"> Based on the GN 704 requirements regarding stormwater management for mining activities it is noted that all clean and dirty water must be separated. The clean water diversion will be sized to accommodate the 1:50 year storm event. The containment facility should be sized to accommodate the anticipated dirty water runoff as a result of the 1:50 year storm event. 	Operational Phase

Activity	Phase	Aspect	Size and scale of disturbance	Mitigation Measures	Compliance with standards	Time period for implementation
				investigation should be undertaken to identify the source of contamination and implement mitigation measures to prevent further contamination.		
Potential spills or leaks from pipeline infrastructure	Operational Phase	Flora & Wetlands	Local Scale (5 km radius)	<ul style="list-style-type: none"> Leak detection will be necessary. Flow meters must be fitted at the start and end of the pipeline to detect if there are any water losses; All erosion noted within the operational footprint as a result of surface activities should be remedied immediately and included as part of the ongoing rehabilitation plan; Maintenance of erosion berms; A suitable AIP control programme must be put in place so as to prevent further encroachment as a result of disturbance to the surrounding terrestrial zones; Permit only essential personnel within the 32 or 100 m zones of regulation for all wetland features identified; No unnecessary crossing of the wetland features and their associated buffers should take place and the substrate conditions of the wetlands and downstream stream connectivity must be maintained; No material may be dumped or stockpiled within or within 500 metres of any rivers, tributaries or drainage lines in the vicinity of the proposed pipeline; All spills from maintenance vehicles or leaks from the pipeline should be immediately cleaned up and treated accordingly; and Monitor all systems for erosion and incision 	<ul style="list-style-type: none"> The NWA Section 21 (c), (g) and (i) of the NWA Section 24 of the Constitution NEM:BA NEMA Department of Water and Forestry (DWAF) guidelines for the delineation of wetlands (2005); Mining and Biodiversity Guideline (DEA et al., 2013); MTPB, 2014 	Operational Phase
Operation of the pipeline	Operational Phase	Soil, Land Use and Land Capability	2 ha Local Scale	<ul style="list-style-type: none"> Twice a year inspections of the pipeline route should be undertaken to ensure that soil erosion has not occurred along the pipeline route and Areas where erosion has occurred should be rehabilitated. 	<ul style="list-style-type: none"> Chamber of Mines Guidelines CARA 	Operational Phase
Operation of the pipeline	Operational Phase	Social	Local Scale	<ul style="list-style-type: none"> Empower the workforce to develop skills that could be transferred to other sectors of the economy; Training and skills development initiatives should be initiated; and Partner with existing community organisations and social departments to jointly assist affected communities, to strengthen the economic development opportunities provided as a result of 	<ul style="list-style-type: none"> Mineral and Petroleum Resource Development Act (Act of 2002); Mine Health and Safety Act (Act of 1996); Occupational Health and Safety, 1993 (Act no. 85 of 1993) (OHS); 	Operational Phase

Activity	Phase	Aspect	Size and scale of disturbance	Mitigation Measures	Compliance with standards	Time period for implementation
				the project.	<ul style="list-style-type: none"> International Human Rights Guiding Principles; IFC PS 4: Community Health, Safety and Security; and National Environmental Management Act (Act of 1998). 	
Decommissioning and rehabilitation of the pipeline	Decommissioning Phase	Surface Water / Aquatic Ecology	Local Scale (5 km radius)	<ul style="list-style-type: none"> Repairs on vehicles and machinery utilised during decommissioning and rehabilitation must only take place in the designated workshop areas at the Mbali Colliery; Vehicles must be maintained according to their maintenance plans; Stationary vehicles should have a drip tray placed below the machine; Machinery and vehicles should be stored at Mbali Colliery when not in use; Extra precautions should be taken in areas within 500 meters of the Klippoortjiespruit to prevent any potential impact to the water course this includes effective stormwater control measures around soil stockpiles to prevent sedimentation of the river. 	<ul style="list-style-type: none"> Based on the GN 704 requirements regarding stormwater management for mining activities it is noted that all clean and dirty water must be separated. The National Water Act (NWA), 1998 (Act No. 36 of 1998) 	Decommissioning Phase
Decommissioning and rehabilitation of the pipeline	Decommissioning Phase	Soil, Land Use and Land Capability	2 ha Local Scale	<ul style="list-style-type: none"> Immediately clean up any hydrocarbon spills in accordance with the hydrocarbon SOP; Vehicles and machinery must be serviced in bunded areas at the Mbali Workshop; Suitable stormwater measures must be implemented to prevent the loss of soil to erosion; The pipeline should only be removed in sections. Once a certain area has been decommissioned and rehabilitated the next section can be removed to prevent further impact to soil; Soil should be deposited on top of the pipeline up to or above ground level so as to prevent trenches from developing which can result in increased erosion; Where the pipeline was placed within the road reserve and no vegetation is present. The area should be rehabilitated and soil compacted. No vegetation is required to be established within these areas; and Areas should be rehabilitated and vegetation allowed (where vegetation was previously cleared during decommissioning) to grow immediately after 	<ul style="list-style-type: none"> Chamber of Mines Guidelines CARA 	Decommissioning Phase

Activity	Phase	Aspect	Size and scale of disturbance	Mitigation Measures	Compliance with standards	Time period for implementation
Site access roads and pipeline crossing wetlands, Removal of infrastructure and rehabilitation	Decommissioning Phase	Flora & Wetlands	2 ha (local)	the pipeline has been removed; <ul style="list-style-type: none"> ▪ Limit the footprint area of the decommissioning and rehabilitation activities to what is absolutely essential in order to minimise impacts as a result of vegetation clearing and compaction of soils (all areas but critically so in wetland areas); ▪ All erosion noted within the decommissioning area footprint should be remedied immediately and included as part of the ongoing rehabilitation plan; ▪ All soils compacted as a result of decommissioning activities should be ripped/scarified (<300 mm) and profiled; ▪ Permit only essential personnel within the zones of regulation for all freshwater features identified; ▪ Wherever possible, restrict decommissioning activities to the drier winter months to avoid sedimentation of the freshwater resources further downstream; ▪ No material may be dumped or stockpiled within any wetland areas (or the buffers) in the vicinity of the proposed decommissioning footprint; ▪ Wetlands and their associated zones of regulation are to be clearly demarcated and avoided wherever possible; ▪ An AIP management plan to be implemented and managed for the life of the proposed decommissioning, rehabilitation, closure and post-closure phases; ▪ As much vegetation growth as possible should be promoted within the proposed development area during all phases. In order to protect soils, vegetation clearance should be kept to a minimum; ▪ Monitor all systems for erosion and incision; ▪ All areas where active erosion is observed should be ripped, re-profiled and seeded with indigenous grasses; ▪ No vehicles or heavy machinery may be allowed to drive indiscriminately within any wetland areas and their associated zones of regulation. All vehicles must remain on demarcated roads and within the project area footprint; ▪ All vehicles must be regularly inspected for leaks; ▪ Re-fueling must take place at the Mbali diesel facility on a sealed surface area away from 	<ul style="list-style-type: none"> ▪ National Environmental Management Act (NEMA), 1998 (Act 107 of 1998) ▪ National Environmental Biodiversity Act (NEMBA), 2004 (Act 10 of 2004) ▪ Conservation of Agriculture Resources Act, 1983 (Act No. 43 of 1983) 	Decommissioning Phase

Activity	Phase	Aspect	Size and scale of disturbance	Mitigation Measures	Compliance with standards	Time period for implementation
				<p>wetlands to prevent ingress of hydrocarbons into topsoil;</p> <ul style="list-style-type: none"> All existing litter, debris should be removed from the wetland areas and littering should be prohibited on an ongoing basis; All spills from machinery should be immediately cleaned up and treated accordingly; Appropriate sanitary facilities must be provided for the duration of the rehabilitation activities and all waste must be removed to an appropriate waste facility; and Wetland monitoring should be carried out monthly during decommissioning and annually during rehabilitation; Ongoing wetland rehabilitation is necessary within and in the vicinity of the proposed decommissioning footprint and appropriate wetland monitoring techniques must take place on an annual basis during the summer/wet season in order to identify any emerging issues, trends or improvements in the receiving environment. 		
Decommissioning and rehabilitation of the pipeline	Decommissioning Phase	Air Quality	Local Scale	<ul style="list-style-type: none"> Vegetation establishment (where vegetation was previously cleared away) must take place on the bare soil to prevent soil erosion and dust creation; Exposed soil must be kept moist using sprays or water tanks to prevent dust creation before vegetation is established (where vegetation was previously cleared away); and Vegetation (where vegetation was previously cleared away) should be planted during the wet season to ensure vegetation establishment and prevent unnecessary costs. 	<ul style="list-style-type: none"> National Environmental Management: Air Quality Act, Act.39 of 2004 standards 2009; National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) - National Dust Control Regulations (2013). Act, 2004 (Act No. 39 of 2004) – National Ambient Air Quality Standard for Particulate Matter with Aerodynamic Diameter less than 2.5 Microns Meters (PM 2.5) 2012 	Decommissioning Phase
Decommissioning and rehabilitation of the pipeline	Decommissioning Phase	Groundwater	Local Scale (5 km radius)	<ul style="list-style-type: none"> Construction vehicles and machinery repairs must only take place in the designated workshop areas at the Mbali Colliery; Vehicles must be maintained according to their maintenance plans; Stationary vehicles should have a drip dray placed below the machine; and 	<ul style="list-style-type: none"> SANS River quality objectives. South African water quality guidelines for drinking, irrigation and livestock watering. 	Decommissioning Phase

Activity	Phase	Aspect	Size and scale of disturbance	Mitigation Measures	Compliance with standards	Time period for implementation
				<ul style="list-style-type: none"> Machinery and vehicles should be stored at Mbali Colliery when not in use. 		
Decommissioning and rehabilitation of the pipeline	Decommissioning Phase	Social	Local Scale	<ul style="list-style-type: none"> Where feasible, promote the creation of employment opportunities for women and youth; Where possible, construction workers and other service providers will be recruited from the Ogies, Kendal, Kriel and surrounding areas to increase employment opportunities for directly affected and local communities; Establish a monitoring system to ensure that the subcontractors honour the specified local employment policy; and If required, the local resident status of applicants should be verified in consultation with community representatives and local government. 	<ul style="list-style-type: none"> Mineral and Petroleum Resource Development Act (Act of 2002); Mine Health and Safety Act (Act of 1996); Occupational Health and Safety, 1993 (Act no. 85 of 1993) (OHS); International Human Rights Guiding Principles; IFC PS 4: Community Health, Safety and Security; and National Environmental Management Act (Act of 1998). 	Decommissioning Phase

6 Impact Management Outcomes

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

Activity	Phase	Aspect	Potential Impact	Mitigation Measures	Compliance with standards
Proposed pipeline route and design	Construction Phase	Flora & Wetlands	The location of pipeline infrastructure occurs either within the delineated freshwater feature areas or within the 32 m or 100 m zones of regulation according to NEMA and Regulation GN704 of the NWA.	<ul style="list-style-type: none"> Ensure that as far as possible all infrastructures result in the least disturbance to delineated freshwater features present; Ensure that sound environmental management is in place during the planning phase as discussed in the site clearing, access and construction of berms impact for wetlands below; Design of infrastructure should be environmentally and structurally sound and all possible precautions taken to prevent spillage to the surface water resources present; and Impacts to surface wetlands are reduced as the proposed pipeline remains within the road reserves and attached to the existing bridge, as opposed to being trenched through water resources (the Klippoortjiespruit), thus minimizing additional fragmentation of the systems. 	<ul style="list-style-type: none"> The NWA Section 21 (c), (g) and (i) of the NWA Section 24 of the Constitution NEM:BA NEMA Department of Water and Forestry (DWAF) guidelines for the delineation of wetlands (2005); Mining and Biodiversity Guideline (DEA et al., 2013); MTPB, 2014
Construction of the Pipeline and associated clearance activities	Construction Phase	Surface Water / Aquatic Ecology	Potential contamination of water from hydrocarbons, as a result of the construction vehicles utilised.	<ul style="list-style-type: none"> Construction vehicles and machinery repairs must only take place in the designated workshop areas at the Mbali Colliery; Vehicles must be maintained according to their 	<ul style="list-style-type: none"> Based on the GN 704 requirements regarding stormwater management for mining activities it is noted that all clean and dirty water must be

Activity	Phase	Aspect	Potential Impact	Mitigation Measures	Compliance with standards
				maintenance plans; <ul style="list-style-type: none"> ▪ Stationary vehicles should have a drip dray placed below the machine; ▪ Machinery and vehicles should be stored at Mbali Colliery when not in use; and ▪ Extra precautions should be taken in areas within 500 meters of the Klippoortjiespruit to prevent any potential impact to the water course this includes effective stormwater control measures around soil stockpiles to prevent sedimentation of the river. 	separated.
Site clearing, access and construction of berms	Construction Phase	Flora & Wetlands	Increased vehicular movement along river crossings and within wetland/riparian zones, resulting in: <ul style="list-style-type: none"> ▪ Potential contamination of soils as a result of the ingress of hydrocarbons; ▪ Compaction of soils; ▪ Loss of natural vegetation; ▪ Increased sedimentation; and ▪ Increased potential for onset of erosion. 	<ul style="list-style-type: none"> ▪ Ensure soil management programme is implemented and maintained to minimise erosion and sedimentation; ▪ During the construction phase, erosion berms should be installed on roadways and downstream of stockpiles to prevent gully formation and siltation of the freshwater resources. The following points should serve to guide the placement of erosion berms: <ul style="list-style-type: none"> ▪ Where the track has slope of less than 2%, berms every 50 m should be installed; ▪ Where the track slopes between 2% and 10%, berms every 25 m should be installed; ▪ Where the track slopes between 10%-15%, berms every 20 m should be installed; and ▪ Where the track has slope greater than 15%, berms every 10 m should be installed. ▪ Active rehabilitation, re-sloping, and re-vegetation of disturbed areas immediately after construction; ▪ Limit the footprint area of the construction activities to what is absolutely essential in order to minimise impacts as a result of vegetation clearing and compaction of soils (all areas but critically so in wetland areas); ▪ If it is absolutely unavoidable that any of the wetland areas present will be affected, disturbance must be minimised and suitably rehabilitated; ▪ Ensure that no incision and canalisation of the wetland features present takes place; ▪ All erosion noted within the construction footprint should be remedied immediately and included as part of an ongoing rehabilitation plan; ▪ Soils which were compacted as a result of construction activities should be ripped/scarified (<300 mm) and profiled; ▪ A suitable Alien Invasive Plant (AIP) control programme must be put in place so as to prevent further encroachment as a result of disturbance to the 	<ul style="list-style-type: none"> ▪ The NWA Section 21 (c), (g) and (i) of the NWA ▪ Section 24 of the Constitution ▪ NEM:BA ▪ NEMA ▪ Department of Water and Forestry (DWAF) guidelines for the delineation of wetlands (2005); ▪ Mining and Biodiversity Guideline (DEA et al., 2013); ▪ MTPB, 2014

Activity	Phase	Aspect	Potential Impact	Mitigation Measures	Compliance with standards
				<p>surrounding terrestrial zones;</p> <ul style="list-style-type: none"> ▪ Permit only essential personnel within the 32 or 100 m zones of regulation for all freshwater features identified; ▪ No unnecessary crossing of the wetland features and their associated buffers should take place and the substrate conditions of the wetlands and downstream stream connectivity must be maintained; ▪ No material may be dumped or stockpiled within or within 500 metres of any rivers, tributaries or drainage lines in the vicinity of the proposed pipeline; ▪ No vehicles or heavy machinery may be allowed to drive indiscriminately within any wetland areas and their associated zones of regulation. All vehicles must remain on demarcated roads and within the construction footprint; ▪ All vehicles must be regularly inspected for leaks; ▪ Re-fueling must take place at the Mbali diesel facility, on a sealed surface area away from wetlands to prevent ingress of hydrocarbons into topsoil; ▪ All spills should be immediately cleaned up and treated accordingly; ▪ Wetlands should be monitored monthly during construction; and ▪ Appropriate sanitary facilities must be provided for the duration of the construction activities and all waste must be removed to an appropriate waste facility. 	
<p>Construction of the Pipeline and associated clearance activities</p>	<p>Construction Phase</p>	<p>Soil, Land Use and Land Capability</p>	<p>During the pipeline construction, soil compaction, erosion and contamination are possible. The soil impacts may be a result of vegetation and topsoil removal for the pipeline, as well as compaction caused by vehicle and machinery onsite.</p>	<ul style="list-style-type: none"> ▪ The pipeline must be constructed in sections not exceeding 100m per section. A maximum of 4 sections may be active at the same time, by the undertaking of one of the following activities per section: ▪ Vegetation Clearance; ▪ Digging of the trench; ▪ Installation of the pipeline; or ▪ Backfilling of the trench and rehabilitation of the footprint. ▪ This means that no more than 400m of pipeline route will be affected at any given time, and concurrent rehabilitation of the pipeline footprint will be implemented. For example, the project will commence with vegetation clearance on Section 1. Once complete, vegetation clearance can continue to Section 2, while excavation of the trench can commence on Section 1. Once complete, vegetation clearance will continue to Section 3, with trench excavation continuing on Section 2, and pipe installation commencing on Section 1. 	<ul style="list-style-type: none"> ▪ Chamber of Mines Guidelines ▪ CARA

Activity	Phase	Aspect	Potential Impact	Mitigation Measures	Compliance with standards
				<p>Finally, Section 1 will be backfilled and rehabilitated, Pipe installation will be undertaken in Section 2, Excavation of the trench will progress to Section 3 and vegetation clearance will progress to Section 4 of the pipeline route. Soil removed for the pipeline construction should be stockpiled and utilised as backfill once each section of pipeline has been constructed;</p> <ul style="list-style-type: none"> ▪ Soil removed for the pipeline construction should be stockpiled and utilised as backfill once each section of pipeline has been constructed; ▪ Soil should be deposited on top of the pipeline up to or above ground level so as to prevent trenches from developing which can result in increased erosion; ▪ Where the pipeline has been constructed within the road reserve and no vegetation is present, the area should be rehabilitated and soil compacted. No vegetation is required to be established within these areas; ▪ Suitable stormwater management measures must be implemented to prevent the loss of soil during rainfall events; ▪ All surfaces that are susceptible to erosion shall be covered with a suitable vegetative cover as soon as construction is completed. ▪ Rehabilitation to be monitored on an annual basis for three years on completion of the construction phase; ▪ Areas where vegetation is cleared (either for the pipeline where vegetation is present or for the laydown area), should be rehabilitated with a suitable vegetation cover once construction has been completed; ▪ The refueling of vehicles must take place either at Mbali Colliery or a petrol station; and ▪ Stockpiling of the pipes to be installed must be limited to only what is required and only be stored in designated areas to avoid any unnecessary soil compaction 	
Construction of the Pipeline and associated clearance activities	Construction Phase	Air Quality	Dust generated from site clearing, soil transportation, vehicle movement and the construction of the pipeline.	<ul style="list-style-type: none"> ▪ The disturbed areas must be kept to a minimum and it is advised to not clear vegetation unnecessarily; and ▪ Water or a chemical dust suppressant should be used to dampen dust generating areas such as areas where soil has been exposed. 	<ul style="list-style-type: none"> ▪ National Environmental Management: Air Quality Act, Act.39 of 2004 standards 2009; ▪ National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) - National Dust Control Regulations (2013). ▪ Act, 2004 (Act No. 39 of 2004) – National Ambient Air Quality Standard for Particulate Matter with Aerodynamic Diameter less than 2.5

Activity	Phase	Aspect	Potential Impact	Mitigation Measures	Compliance with standards
					Microns Meters (PM 2.5) 2012
Construction of the Pipeline and associated clearance activities	Construction Phase	Groundwater	Contamination of groundwater due to hydrocarbon spillages.	<ul style="list-style-type: none"> Construction vehicles and machinery repairs must only take place in the designated workshop areas at the Mbali Colliery; Vehicles must be maintained according to their maintenance plans; Stationary vehicles should have a drip dray placed below the machine; and Machinery and vehicles should be stored at Mbali Colliery when not in use. 	<ul style="list-style-type: none"> SANS River quality objectives. South African water quality guidelines for drinking, irrigation and livestock watering.
Construction of the Pipeline and associated clearance activities	Construction Phase	Social	Creation of jobs during the construction phase of the pipeline	<ul style="list-style-type: none"> Where feasible, promote the creation of employment opportunities for women and youth; Where possible, construction workers and other service providers will be recruited from the Ogies, Kendal, Kriel and surrounding areas to increase employment opportunities for directly affected and local communities; Establish a monitoring system to ensure that the subcontractors honour the specified local employment policy; and If required, the local resident status of applicants should be verified in consultation with community representatives and local government. 	<ul style="list-style-type: none"> Mineral and Petroleum Resource Development Act (Act of 2002); Mine Health and Safety Act (Act of 1996); Occupational Health and Safety, 1993 (Act no. 85 of 1993) (OHS); International Human Rights Guiding Principles; IFC PS 4: Community Health, Safety and Security; and National Environmental Management Act (Act of 1998).
Construction of the Pipeline and associated clearance activities	Construction Phase	Heritage	Impact to heritage resources	<ul style="list-style-type: none"> Establish Project-specific Chance and Fossil Find Protocols and Procedures (CFPs) as a condition of authorisation. 	<ul style="list-style-type: none"> The National Heritage Resources Act, 1999 (Act No. 25 of 1999) Regulations to the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (GN R 548) (SAHRA Regulations) SAHRA Minimum Standards: Archaeological and Paleontological Components of Impact Assessment Reports
Operation of the pipeline	Operational Phase	Surface Water / Aquatic Ecology	Surface water quality / quantity may be impacted upon should a leak occur in the pipeline as the water quality is not currently known. A sudden burst in the pipeline will result in a sudden increase of water into the surface water resources and can result in an impact on both water quality and quantity.	<ul style="list-style-type: none"> Flow meters must be installed at either end of the pipeline to ensure that the same amount of water leaving TWRP, enters the Mbali Colliery; These reading should be taken on a daily basis and reported on monthly to HCI headquarters. Additionally these readings should be incorporated into the quarterly surface and groundwater monitoring report currently being undertaken for Mbali which is submitted to DWS; Comparisons between the volumes dispensed and received should be made to ensure no leaks in the pipeline have occurred; Should a variation be identified, further investigation 	<ul style="list-style-type: none"> Based on the GN 704 requirements regarding stormwater management for mining activities it is noted that all clean and dirty water must be separated. The National Water Act (NWA), 1998 (Act No. 36 of 1998)

Activity	Phase	Aspect	Potential Impact	Mitigation Measures	Compliance with standards
				<ul style="list-style-type: none"> must be undertaken to identify the location of the leak. Any leaks in the pipeline must be repaired immediately; and Surface water monitoring must be implemented at the locations identified in Part B Section 8.1.2. 	
Operation of the pipeline	Operational Phase	Surface Water	<p>The operation of the pipeline will result in an increased amount of water being utilised within the coal wash plant which could result in increased contaminated water run-off. This can lead to potential additional surface water contamination if not contained correctly.</p>	<ul style="list-style-type: none"> Effective stormwater management must be implemented / improved on at the coal wash plant, PCD, and slurry ponds at Mbalu to ensure that the increased amount of water to be discharged is contained in the PCD or slurry ponds and to prevent the siltation of these water containment facilities; The PCD and slurry pond are lined and are not expected to seep. This however needs to be confirmed and the integrity of the liner should be verified. A water balance will assist in achieving this and confirm if the liner is not leaking; All surface water pollution control structures will be inspected on a weekly basis and maintenance work carried out as required. Furthermore, all structures (e.g. dams) registered in terms of the NWA will be maintained in accordance with the Act; All water management containment facilities must be maintained and is required to operate with a 0.8 m freeboard and able to contain a 1:100 year flood event; Additional surface water monitoring points should be incorporated into the Mbalu Colliery water monitoring network to ensure no further contamination on surface water resources occur (Ref to Part B Section 8.1.2); and Should contamination be identified further investigation should be undertaken to identify the source of contamination and implement mitigation measures to prevent further contamination. 	<ul style="list-style-type: none"> Based on the GN 704 requirements regarding stormwater management for mining activities it is noted that all clean and dirty water must be separated. The clean water diversion will be sized to accommodate the 1:50 year storm event. The containment facility should be sized to accommodate the anticipated dirty water runoff as a result of the 1:50 year storm event.
Potential spills or leaks from pipeline infrastructure	Operational Phase	Flora & Wetlands	<p>Among the impacts associated with the proposed project are potential impacts to soil and water quality as a result of the ingress of spills associated with the pipeline.</p>	<ul style="list-style-type: none"> Leak detection will be necessary. Flow meters must be fitted at the start and end of the pipeline to detect if there are any water losses; All erosion noted within the operational footprint as a result of surface activities should be remedied immediately and included as part of the ongoing rehabilitation plan; Maintenance of erosion berms; A suitable AIP control programme must be put in place so as to prevent further encroachment as a result of disturbance to the surrounding terrestrial zones; Permit only essential personnel within the 32 or 100 m zones of regulation for all wetland features identified; 	<ul style="list-style-type: none"> The NWA Section 21 (c), (g) and (i) of the NWA Section 24 of the Constitution NEM:BA NEMA Department of Water and Forestry (DWAF) guidelines for the delineation of wetlands (2005); Mining and Biodiversity Guideline (DEA et al., 2013); MTPB, 2014

Activity	Phase	Aspect	Potential Impact	Mitigation Measures	Compliance with standards
				<ul style="list-style-type: none"> No unnecessary crossing of the wetland features and their associated buffers should take place and the substrate conditions of the wetlands and downstream stream connectivity must be maintained; No material may be dumped or stockpiled within or within 500 metres of any rivers, tributaries or drainage lines in the vicinity of the proposed pipeline; All spills from maintenance vehicles or leaks from the pipeline should be immediately cleaned up and treated accordingly; and Monitor all systems for erosion and incision 	
Operation of the pipeline	Operational Phase	Soil, Land Use and Land Capability	Soil erosion due to loss of vegetation along the pipeline route	<ul style="list-style-type: none"> Twice a year inspections of the pipeline route should be undertaken to ensure that soil erosion has not occurred along the pipeline route; and Areas where erosion has occurred should be rehabilitated. 	<ul style="list-style-type: none"> Chamber of Mines Guidelines CARA
Operation of the pipeline	Operational Phase	Social	Continuation of jobs during the operational phase at the coal wash plant once LoM is reached at Mbali Colliery	<ul style="list-style-type: none"> Empower the workforce to develop skills that could be transferred to other sectors of the economy; Training and skills development initiatives should be initiated; and Partner with existing community organisations and social departments to jointly assist affected communities, to strengthen the economic development opportunities provided as a result of the project. 	<ul style="list-style-type: none"> Mineral and Petroleum Resource Development Act (Act of 2002); Mine Health and Safety Act (Act of 1996); Occupational Health and Safety, 1993 (Act no. 85 of 1993) (OHS); International Human Rights Guiding Principles; IFC PS 4: Community Health, Safety and Security; and National Environmental Management Act (Act of 1998).
Decommissioning and rehabilitation of the pipeline	Decommissioning Phase	Surface Water / Aquatic Ecology	Potential contamination of water from hydrocarbons, as a result of the vehicles utilised during decommissioning.	<ul style="list-style-type: none"> Repairs on vehicles and machinery utilised during decommissioning and rehabilitation must only take place in the designated workshop areas at the Mbali Colliery; Vehicles must be maintained according to their maintenance plans; Stationary vehicles should have a drip tray placed below the machine; Machinery and vehicles should be stored at Mbali Colliery when not in use; Extra precautions should be taken in areas within 500 meters of the Klippoortjiespruit to prevent any potential impact to the water course this includes effective stormwater control measures around soil stockpiles to prevent sedimentation of the river. 	<ul style="list-style-type: none"> Based on the GN 704 requirements regarding stormwater management for mining activities it is noted that all clean and dirty water must be separated. The National Water Act (NWA), 1998 (Act No. 36 of 1998)
Decommissioning and	Decommissioning Phase	Soil, Land Use	The underlying soil will be	<ul style="list-style-type: none"> Immediately clean up any hydrocarbon spills in 	<ul style="list-style-type: none"> Chamber of Mines Guidelines

Activity	Phase	Aspect	Potential Impact	Mitigation Measures	Compliance with standards
rehabilitation of the pipeline		and Land Capability	compacted and susceptible to erosion. Topsoil will need replacement on the pipeline route. Hydrocarbon spillages from vehicles and machinery used during decommissioning could contaminate soil resources.	accordance with the hydrocarbon SOP; <ul style="list-style-type: none"> ▪ Vehicles and machinery must be serviced in banded areas at the Mbali Workshop; ▪ Suitable stormwater measures must be implemented to prevent the loss of soil to soil erosion; ▪ The pipeline should only be removed in sections. Once a certain area has been decommissioned and rehabilitated the next section can be removed to prevent further impact to soil; ▪ Soil should be stockpiled and utilised to rehabilitate the area once the pipeline has been removed. ▪ Soil should be deposited on top of the pipeline up to or above ground level so as to prevent trenches from developing which can result in increased erosion; ▪ Where the pipeline was placed within the road reserve and no vegetation is present. The area should be rehabilitated and soil compacted. No vegetation is required to be established within these areas; and ▪ Areas should be rehabilitated and vegetation allowed (where vegetation was previously cleared during decommissioning) to grow immediately after the pipeline has been removed; 	<ul style="list-style-type: none"> ▪ CARA
Site access roads and pipeline crossing wetlands, Removal of infrastructure and rehabilitation	Decommissioning Phase	Flora & Wetlands	Increased vehicular movement along river crossings and within wetland/riparian zones, resulting in: <ul style="list-style-type: none"> ▪ Potential contamination of soils as a result of the ingress of hydrocarbons; ▪ Loss of natural vegetation; ▪ Increased sedimentation; ▪ Increased potential for onset of erosion; ▪ Potential dumping of decommissioned infrastructure in wetland/riparian areas; and ▪ Potential incomplete removal of infrastructure. 	<ul style="list-style-type: none"> ▪ Limit the footprint area of the decommissioning and rehabilitation activities to what is absolutely essential in order to minimise impacts as a result of vegetation clearing and compaction of soils (all areas but critically so in wetland areas); ▪ All erosion noted within the decommissioning area footprint should be remedied immediately and included as part of the ongoing rehabilitation plan; ▪ All soils compacted as a result of decommissioning activities should be ripped/scarified (<300 mm) and profiled; ▪ Permit only essential personnel within the zones of regulation for all freshwater features identified; ▪ Wherever possible, restrict decommissioning activities to the drier winter months to avoid sedimentation of the freshwater resources further downstream; ▪ No material may be dumped or stockpiled within any wetland areas (or the buffers) in the vicinity of the proposed decommissioning footprint; ▪ Wetlands and their associated zones of regulation are to be clearly demarcated and avoided wherever possible; ▪ An AIP management plan to be implemented and managed for the life of the proposed decommissioning, 	<ul style="list-style-type: none"> ▪ National Environmental Management Act (NEMA), 1998 (Act 107 of 1998) ▪ National Environmental Biodiversity Act (NEMBA), 2004 (Act 10 of 2004) ▪ Conservation of Agriculture Resources Act, 1983 (Act No. 43 of 1983)

Activity	Phase	Aspect	Potential Impact	Mitigation Measures	Compliance with standards
				<ul style="list-style-type: none"> rehabilitation, closure and post-closure phases; ▪ As much vegetation growth as possible should be promoted within the proposed development area during all phases. In order to protect soils, vegetation clearance should be kept to a minimum; ▪ Monitor all systems for erosion and incision; ▪ All areas where active erosion is observed should be ripped, re-profiled and seeded with indigenous grasses; ▪ No vehicles or heavy machinery may be allowed to drive indiscriminately within any wetland areas and their associated zones of regulation. All vehicles must remain on demarcated roads and within the project area footprint; ▪ All vehicles must be regularly inspected for leaks; ▪ Re-fueling must take place at the Mbali diesel facility on a sealed surface area away from wetlands to prevent ingress of hydrocarbons into topsoil; ▪ All existing litter, debris should be removed from the wetland areas and littering should be prohibited on an ongoing basis; ▪ All spills from machinery should be immediately cleaned up and treated accordingly; ▪ Appropriate sanitary facilities must be provided for the duration of the rehabilitation activities and all waste must be removed to an appropriate waste facility; and ▪ Wetland monitoring should be carried out monthly during decommissioning and annually during rehabilitation; ▪ Ongoing wetland rehabilitation is necessary within and in the vicinity of the proposed decommissioning footprint and appropriate wetland monitoring techniques must take place on an annual basis during the summer/wet season in order to identify any emerging issues, trends or improvements in the receiving environment. 	
Decommissioning and rehabilitation of the pipeline	Decommissioning Phase	Air Quality	The extent of impacts depends on the extent of demolition and rehabilitation efforts during decommissioning. Impacts of this activity on the atmospheric environment will be similar to the impacts during the construction phase. The impacts will be short-term and localised.	<ul style="list-style-type: none"> ▪ Vegetation establishment (where vegetation was previously cleared away) must take place on the bare soil to prevent soil erosion and dust creation; ▪ Exposed soil must be kept moist using sprays or water tanks to prevent dust creation before vegetation is established (where vegetation was previously cleared away); and ▪ Vegetation (where vegetation was previously cleared away) should be planted during the wet season to ensure vegetation establishment and prevent unnecessary costs. 	<ul style="list-style-type: none"> ▪ National Environmental Management: Air Quality Act, Act.39 of 2004 standards 2009; ▪ National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) - National Dust Control Regulations (2013). ▪ Act, 2004 (Act No. 39 of 2004) – National Ambient Air Quality Standard for Particulate Matter with Aerodynamic Diameter less than 2.5

Activity	Phase	Aspect	Potential Impact	Mitigation Measures	Compliance with standards
					Microns Meters (PM 2.5) 2012
Decommissioning and rehabilitation of the pipeline	Decommissioning Phase	Groundwater	Contamination of groundwater due to hydrocarbon spillages from vehicles utilised during decommissioning activities.	<ul style="list-style-type: none"> ▪ Construction vehicles and machinery repairs must only take place in the designated workshop areas at the Mbali Colliery; ▪ Vehicles must be maintained according to their maintenance plans; ▪ Stationary vehicles should have a drip dray placed below the machine; and ▪ Machinery and vehicles should be stored at Mbali Colliery when not in use. 	<ul style="list-style-type: none"> ▪ SANS ▪ River quality objectives. ▪ South African water quality guidelines for drinking, irrigation and livestock watering.
Decommissioning and rehabilitation of the pipeline	Decommissioning Phase	Social	Creation of jobs during decommissioning and rehabilitation phase while the pipeline is being removed	<ul style="list-style-type: none"> ▪ Where feasible, promote the creation of employment opportunities for women and youth; ▪ Where possible, construction workers and other service providers will be recruited from the Ogies, Kendal, Kriel and surrounding areas to increase employment opportunities for directly affected and local communities; ▪ Establish a monitoring system to ensure that the subcontractors honour the specified local employment policy; and ▪ If required, the local resident status of applicants should be verified in consultation with community representatives and local government. 	<ul style="list-style-type: none"> ▪ Mineral and Petroleum Resource Development Act (Act of 2002); ▪ Mine Health and Safety Act (Act of 1996); ▪ Occupational Health and Safety, 1993 (Act no. 85 of 1993) (OHS); ▪ International Human Rights Guiding Principles; ▪ IFC PS 4: Community Health, Safety and Security; and ▪ National Environmental Management Act (Act of 1998).

7 Financial Provision

HCI Coal proposes to obtain environmental authorisation for the proposed construction and operation of the pipeline to transfer water from the TWRP to the Mbali Colliery. Therefore the basic assessment process has assessed and provided mitigation measures for the decommissioning and rehabilitation of the pipeline however no separate closure plan or financial provision for the pipeline will be compiled as this will be included as part of the Mbali Colliery closure plan which is updated on an annual basis.

7.1 Determination of the amount of Financial Provision

7.1.1 Describe the Closure Objectives and the extent to which they have been aligned to the Baseline Environment described under the Regulation

Closure and rehabilitation is a continuous series of activities that begin with planning prior to the project's design and construction, and end with achievement of long-term site stability and the establishment of a self-sustaining ecosystem. Not only will the implementation of this concept result in a more satisfactory environmental conclusion, but it will also reduce the financial burden of closure and rehabilitation. The following points outline the main objectives for rehabilitation and closure:

- Make all areas safe for both humans and animals;
- Make all areas stable and sustainable;
- Follow a process of closure that is progressive and integrated into the short and long term plans, and that will assess the closure impacts proactively at regular intervals throughout project life;
- Maintain and monitor all rehabilitated areas following re-vegetation and, if this monitoring shows that the objectives have been met, make an application for closure (if required);
- Comply with local, district and national regulatory requirements; and
- Follow a comprehensive consultation and communication process with all stakeholders.

Rehabilitation and closure objectives have been tailored to the project at hand. This Rehabilitation, Decommissioning and Mine Closure Plan aims to assist Mbali Colliery in carrying out successful rehabilitation for the project.

7.1.2 Confirm specifically that the Environmental Objectives in relation to Closure have been consulted with Landowner and Interested and Affected Parties

A separate closure plan does not form part of this BAR process. The activities relevant to the pipeline will be included in the Mbali closure plan and financial provisioning during the annual updates. However this BAR will be made available for public review for a period of 30 days.

7.1.3 Provide a Rehabilitation Plan that describes and shows the scale and aerial extent of the Main Mining Activities, including the Anticipated Mining Area at the time of Closure

This section is considered to be not applicable. A rehabilitation plan will be compiled once decommissioning of the pipeline is proposed (such decommissioning will be a Listed activity and will be subject to EA).

7.1.4 Explain why it can be confirmed that the rehabilitation plan is compatible with the Closure Objectives

This section is considered to be not applicable. A rehabilitation plan will be compiled once decommissioning of the pipeline is proposed.

7.1.5 Calculate and state the quantum of the Financial Provision required to manage and Rehabilitate the Environment in accordance with the applicable guideline

The proposed pipeline will be incorporated into the existing Mbali Colliery financial provisioning during the next update (financial provisioning calculations are updated annually).

7.1.6 Confirm that the Financial Provision will be provided as determined

HCI Coal will be obliged to align the relevant guarantees related to closure and rehabilitation of the Mbali Colliery, to include the proposed pipeline route, following the annual financial provisioning update.

8 Monitoring Compliance with and Performance Assessment

Mechanisms for monitoring compliance with and performance assessment against the environmental management programme and reporting thereon, including:

8.1 Monitoring of Impact Management Actions

A monitoring programme is essential as a management tool to detect negative impacts as they arise and to ensure that the necessary mitigation measures are implemented. The monitoring programmes have been discussed below.

8.1.1 Flora and Wetlands

The flora and wetland systems should be monitored monthly during construction / decommissioning phase and annually for 3 years after the construction / post closure phase has been completed. The monitoring must be undertaken during the ECO audit and the following should be assessed as part of the monitoring:

- Ensure no erosion is observed where the pipeline has been constructed or is being constructed;
- Ensure an AIP has been compiled and is being implemented. Ensure all invasive species are being successfully removed around the pipeline;
- Ensure that where vegetation has been cleared, suitable vegetation regrowth has occurred; and
- Through visual inspection ensure that no impact to the flora or wetland environments has occurred during the various phases.

8.1.2 Surface Water

Mbali Colliery has a surface water monitoring and reporting programme in place. The existing monitoring and reporting programme is based upon the recommendations made in the environmental monitoring chapter of the Environmental Management Plan (EMP) for the Mbali Colliery as well as monitoring requirements specified in the approved Water Use License (license no: 04/B11C/ACGIJ/995) issued for the Mbali Colliery. Table 8-1 provides the coordinates of the monitoring locations. It is proposed that an additional three sampling locations are included as part of this proposed project as listed in Table 8-2. These additional sampling points will be included in the WUL for the proposed project. It is noted that the surface water monitoring program must be updated to include these additional points. Plan 14 presents the proposed and existing surface water monitoring at Mbali.

Based on the WUL (No: 04/B11F/ACGIJ/1755), Mbali Colliery has to undertake monthly water monitoring that includes:

- Monthly surface sampling;
- Quarterly reporting; and
- An Annual Report.


Table 8-1: Mbali water monitoring points

Monitoring Name	Latitude (S)	Longitude (E)
Surface water		
MSW1	26°7'9.86"S	29°6'49.30"E
MSW2	26°7'29.61"S	29°6'44.72"E
MSW3	26°7'44.04"S	29°6'37.98"E
MSW4	26°8'6.81"S	29°6'24.24"E
Waste water		
PCD	26°7'29.86"S	29°6'39.92"E
STP	26°7'29.67"S	29°6'42.30"E
Drinking water taps		
Workshop Tap	26°7'34.81"S	29°6'32.04"E
Office Kitchen Tap	26°7'27.99"S	29°6'37.20"E
Lab Tap	26°7'45.15"S	29° 6'28.56"E
Diesel Power Tap	26°7'41.85"S	29°7'17.24"E
Weighbridge Tap	26°7'30.20"S	29°6'34.02"E
Security Tap	26°7'26.68"S	29°6'35.46"E
Plant Kitchen Tap	26°7'34.88"S	29°6'32.38"E
Wash bay Tap	26°7'34.58"S	29°6'32.02"E
Ad-hoc samples		
Old house borehole	26°7'25.67"S	29°7'14.11"E
Anton's borehole	26°7'0.00"S	29°7'15.23"E
School BH	26°6'45.02"S	29°7'12.20"E
BH11	26°7'8.90"S	29°6'48.43"E
Safika Oosthuizen	26°7'10.32"S	29°7'11.84"E

Table 8-2: Proposed additional surface water monitoring locations for the proposed Pipeline

Monitoring Name	Latitude (S)	Longitude (E)
Surface water		
MSW5 – Upstream of pipeline	26°05'59.73"S	29°07'18.95"E
MSW6 - Upstream of pipeline	26°06'07.59"S	29°06'33.06"E
MSW7 – Down stream of pipeline	26°06'10.78"S	29°06'30.05"E

8.1.2.1 Sampling Protocol

Water samples must be taken to a South African National Accreditation System (SANAS) accredited laboratory. The chemical constituents that should be analysed are listed in Table 8-3 and are in line with the WUL requirements.

Table 8-3: Water Quality Constituents Analysed

Constituents	Constituents	Constituents
Total Dissolved Solids (TDS)	Electrical Conductivity in mS/m (EC)	pH value at 25°C
Total Alkalinity as CaCO ₃	Magnesium (Mg)	Potassium (K)
Nitrate (NO ₃) as N	Sodium (Na)	Orthophosphate (PO ₄) as P
Chloride (Cl)	Calcium (Ca)	Iron (Fe)
Fluoride (F)	Sulphate (SO ₄)	Ammonium (NH ₄) as N
Aluminium (Al)	Manganese (Mn)	Mercury (Hg)

8.1.2.2 Water Sample Analyses

Samples must be handled, stored and transported to the laboratory in accordance with established protocols using Chain of Custody documentation which must be used to track samples to the contracted laboratory and to ensure that the correct analysis was performed.

8.1.2.3 Data Capturing

The results must be captured in a Windows Interpretation System for Hydrogeologists (WISH) software. WISH is a powerful database management software with competent GIS and data interpretation tools.

8.1.2.4 Data Interpretation

As per the WUL requirements, the surface qualities must be benchmarked against the in-stream water quality objectives as indicated in Table 8-4.

Table 8-4: WUL standards for the surface and groundwater quality

Variables	Resource Quality Objectives
pH value at 25°C	6.5 – 9.0
Electrical Conductivity in mS/m (EC)	70
Total Dissolved Solids (TDS) in mg/L	500
Chloride (Cl) in mg/L	25
Nitrate (NO ₃) as N in mg/L	6
Sulphate (SO ₄) in mg/L	300
Calcium (Ca) in mg/L	130
Sodium (Na) in mg/L	70
Magnesium (Mg) in mg/L	70
Fluoride (F) in mg/L	1.0
Potassium	50

8.1.3 Rehabilitation

The purpose of monitoring is to ensure that the objectives of rehabilitation are met and that the rehabilitation process is followed. The physical aspects of rehabilitation should be carefully monitored after construction phase has been completed as well as during the progress of establishment of the desired final ecosystem (Rehabilitation phase). Rehabilitation monitoring must be undertaken on an annual basis for three years on completion of the construction phase and for three years once the decommissioning phase has been completed.

Rehabilitation monitoring must include the following:

- Ensure the vegetation which was disturbed from the construction and decommissioning phase is rehabilitated back to its original natural state; and
- Ensure no soil erosion within the rehabilitated areas has occurred. Should soil erosion be identified mitigation measures must be implemented to address the issue.

8.2 Monitoring and Reporting Frequency

Table 8-5 discusses the monitoring and reporting frequency.

8.3 Responsible Persons

The roles and responsibilities associated with the monitoring programme are set out in Table 8-5.

8.4 Time period for Implementing Impact Management Actions

Table 8-5 captures the time period for implementing impact management actions.

8.5 Mechanism for Monitoring Compliance

Table 8-5 sets out the method of monitoring, the implementation of the impact management actions, the frequency of monitoring the implementation of the impact management actions, an indication of the persons who will be responsible for the implementation of the impact management actions, the time periods within which the impact management actions must be implemented and the mechanism for monitoring compliance with the identified impact management actions.

Table 8-5: Monitoring and Management of Environmental Impacts

Source Activity	Impacts requiring monitoring programmes	Functional requirements for monitoring	Roles and responsibilities (For the execution of the monitoring programmes)	Monitoring and reporting frequency and time periods for implementing impact management actions
All activities	Monitoring of fauna and Wetlands	<p>The monitoring must be undertaken during the ECO audit and the following should be assessed as part of the monitoring:</p> <ul style="list-style-type: none"> ▪ Ensure no erosion is observed where the pipeline has been constructed or is being constructed; ▪ Ensure an AIP has been compiled and is being implemented. Ensure all invasive species are being successfully removed around the pipeline; ▪ Ensure that where vegetation has been cleared, suitable vegetation regrowth has occurred; and ▪ Through visual inspection ensure that no impact to the flora or wetland environments has occurred during the various phases. 	Fauna and Wetland monitoring should be undertaken by an independent Environmental Officer/Independent Third Party	Monthly during construction / decommissioning phase and annually for 3 years after the construction / post closure phase has been completed.
All activities	Monitoring of Flora	Compile and Implement alien plant monitoring to prevent the establishment of alien invasive plant species.	An AIP should be compiled by a qualified botanist to be implemented. Alien invasive species monitoring utilising the AIP should be undertaken by an independent Environmental Officer/Independent Third Party.	Annual monitoring for three years after construction and decommissioning and rehabilitation phase
Audit Reports	Auditing against the construction / decommissioning conditions outlined within the approved EMP and EA (EMP Performance Assessment)	To determine compliance to EMP conditions.	Internal Environmental Officer Independent Third Party (external ECO)	Daily monitoring by Internal Environmental Officer during construction / decommissioning phase Monthly monitoring by external ECO during construction phase
Audit Reports	Auditing against the operational conditions outlined within the approved EMP and EA (EMP Performance Assessment)	To determine compliance to EMP conditions	Environmental Officer/Independent Third Party	Biennial (once every two years) Performance Assessment
All activities	Rehabilitation activities during construction and decommissioning phase	The purpose of monitoring is to ensure that the objectives of rehabilitation are met and that the rehabilitation process is followed.	Environmental Officer/Independent Third Party	Annual monitoring for three years after construction and decommissioning and rehabilitation phase

9 Indicate the Frequency of the Submission of the Performance Assessment / Environmental Audit Report

Monitoring to be undertaken during the construction /decommissioning phase of the pipeline must be completed daily by the internal ECO appointed at Mbali and monthly by an external independent ECO. The reports must be submitted to the DMR on a monthly basis. A performance assessment report for the pipeline during operation phase will be submitted on a biennial basis (every second year) to the DMR.

10 Environmental Awareness Plan

10.1 Manner in which the applicant intends to inform his or her employees of any environmental risk which may result from their work

HCI Coal has developed internal Environmental, Health and Safety Policies. The Environmental Policy will be communicated to all personnel, whether they are contractors or permanent staff, and the policy will be displayed at Mbali Colliery and at the contractors yard.

Employees will receive general environmental awareness training on specific items contained in this EMP, as well as on Best Possible Environmental Practices (BPEP).

10.1.1 Specific Environmental Training

Environmental Awareness Training will be undertaken to make employees and contractors aware of the following:

- The importance of conforming with the environmental policy and procedures and with the requirements of the EMP;
- The significant social and environmental impacts of their work activities and the environmental benefits of improved personal performance;
- Their roles and responsibilities in achieving conformance with the environmental policy and procedures and with the requirements of the environmental management system;
- The potential consequences of departure from specified operating procedures; and
- Possible archaeological finds action steps for mitigation measures, surface collections, excavations and communication routes to follow in the case of a discovery.

The guidelines for training are summarised below, which are in line with the ISO 14001:2004 guidelines with regards to training and awareness creation.

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Table 10-1: Training Guidelines

Types of Training	Audience	Purpose
Raising awareness of the strategic importance of environmental management	Senior management	To gain commitment and alignment to the organisation's environmental policy.
Raising general environmental awareness	All employees	To gain commitment to the environmental policy and objectives and to instil a sense of individual responsibility.
Skill enhancement	Employees with environmental responsibilities	To improve performance in specific tasks.
Compliance	Employees whose actions can affect compliance	To ensure that regulatory and internal requirements for training are met.

The training programme will consist of the following elements:

- Identification of employee training needs;
- Development of a training plan to address defined needs;
- Verification of conformance of the training programme to regulatory or organisation requirements and standards;
- Training of target employee groups;
- Documentation of training received; and
- Evaluation of training received.

This training is undertaken on an annual basis for all personnel, together with the annual required induction programmes. The training material provided will be subject to annual review, based on issues such as incidents, accidents, new legislative requirements, modified processes and environmental and social aspects identified from time to time. This training is to be carried out and coordinated internally by HCI Coal.

HCI Coal will, therefore, develop the capabilities and support mechanisms necessary to achieve its environmental policy, objectives and targets.

In addition, the Mbali Colliery Emergency Preparedness and Response Plan will be updated to include measures relevant to the proposed pipeline and communicated and trained to all site personnel during the induction process.

10.2 Manner in which risks will be dealt with in order to avoid pollution or the degradation of the environment

An Emergency Response Plan has been developed for the Mbali Colliery and will be updated and implemented for the proposed pipeline project. The approach used by HCI Coal to respond to risks that may pollute or degrade the environment during the construction, operational and decommissioning phase is detailed in this internal procedure.

The unplanned events that may happen at the project site and the proposed mitigation plan are listed in Table 10-2.

Table 10-2: Unplanned events, risks and their management measures

Unplanned event	Mitigation / Management / Monitoring
Hydrocarbon spills from vehicles, heavy machinery and workshop areas.	<ul style="list-style-type: none"> ▪ Hydrocarbons and hazardous substances must be stored in bunded areas and any refuelling should take place in contained areas (existing approved areas at Mbali Colliery); ▪ Vehicles and heavy machinery should be serviced and checked on a regular basis according to the maintenance plan of each to prevent leakages and spills; and ▪ All stationary vehicles must have drip trays placed beneath them to prevent any hydrocarbon contamination.
Spills form hazardous materials or waste storage facilities.	<ul style="list-style-type: none"> ▪ Implementation of storm water management system around hazardous materials or waste storage facilities to contain spills (for the pipeline project, all hazardous materials and waste will be managed at the approved facilities at Mbali Colliery); ▪ Provide sufficient capacities for the storage of waste (temporary waste bins for use by construction workers on the construction site, to be emptied to the Mbali waste management facilities); ▪ Ensure that an agreement is in place with a suitable qualified service provider to remove the waste on a regular bases; and ▪ All hazardous waste should be removed by a suitably qualified service provider and disposed of to an approved permitted landfill site.

10.2.1 Low Risks and unplanned events impacting on heritage

No heritage resources were identified during the pre-disturbance survey. In the event that heritage resources are subsequently identified, and where HCI Coal knowingly does not take proactive management measures, potential risks to HCI Coal may include litigation in terms of Section 51 of the NHRA and social or reputational repercussions. A summary of the primary risks that may arise for HCI Coal is presented in Table 10-3.



Table 10-3: Identified heritage risks that may arise for HCI

Description	Primary Risk
Heritage resources with a high CS rating are inherently sensitive to any development in so far that the continued survival of the resource could be threatened. In addition to this, certain heritage resources are formally protected thereby restricting various development activities.	Negative Record of Decision (RoD) and/or development restrictions issued by SAHRA and/or MPRHA in terms of Section 38(8).
Impacting on heritage resources formally and generally protected by the NHRA without following due process. Due process may include social consultations and/or permit application processes to SAHRA and/or MPRHA.	Fines Penalties Seizure of Equipment Compulsory Repair / Cease Work Orders Imprisonment

In the event that heritage resources are identified during construction of the pipeline, potential risks to those heritage resources will need to be assessed as discussed in Table 10-4.

Table 10-4: Management plan to be implemented should heritage resources be identified

Unplanned event	Potential impact	Mitigation / Management / Monitoring
Accidental exposure of fossil bearing material implementation of the Project	Damage or destruction of heritage resources generally protected under Section 35 of the NHRA	Establish Project-specific Chance Find Protocols (CFPs) as a condition of authorisation.
Accidental exposure of <i>in situ</i> MSA and LSA accumulations during implementation of the Project		
Accidental exposure of <i>in situ</i> LFC settlement sites during the implementation of the Project		
Accidental exposure of <i>in situ</i> historical built environment sites during the implementation of the Project	Damage or destruction of heritage resources generally protected under Section 34 of the NHRA	

Unplanned event	Potential impact	Mitigation / Management / Monitoring
Accidental exposure of <i>in situ</i> burial grounds or graves during the implementation of the Project	Damage or destruction of heritage resources generally protected under Section 36 of the NHRA	
Accidental exposure of human remains during the construction phase of the Project		

11 Specific Information required by the Competent Authority

No request for specific information has been requested for this proposed project by the DMR to date.

12 Undertaking

The EAP herewith confirms:-

- the correctness of the information provided in the reports
- the inclusion of comments and inputs from stakeholders and I&APs ;
- the inclusion of inputs and recommendations from the specialist reports where relevant; and
- the acceptability of the project in relation to the finding of the assessment and level of mitigation proposed.

Signature of the Environmental Assessment Practitioner:	
Name of Company:	Digby Wells Environmental
Date:	

13 References

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Appendix A: CV

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Appendix B: Plans

Plan 1: Regional Map

Plan 2: Local Map

Plan 3: Land Tenure Map

Plan 4: Pipeline Route Alternative Map

Plan 5: Wetland Delineation with Buffer Zones

Plan 6: Flora Habitats Delineation

Plan 7: Present Ecological State for the Proposed Project Area

Plan 8: Ecological Importance and Sensitivity for the Proposed Project Area

Plan 9: Flora Sensitivity Map

Plan 10: Heritage Survey

Plan 11: Land Use Map

Plan 12: Final Infrastructure Map

Plan 13: Composite Map

Plan 14: Surface Water Monitoring Locations (Existing and Proposed Locations)

Plan 15: River crossing at GHM Unit 1

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Appendix C: PPP

Plan 16: Site Notice Map

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Appendix D: Cultural Heritage Specialist Study

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Appendix E: Flora and Wetland Specialist Study