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BASIC ASSESSMENT REPORT

HARMONY FSS6 RECLAMATION PIPELINE PROJECT

NOVEMBER 2021

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BASIC ASSESSMENT REPORT

and

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

SUBMITTED FOR ENVIRONMENTAL AUTHORIZATIONS IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 IN RESPECT OF LISTED ACTIVITIES THAT HAVE BEEN TRIGGERED BY APPLICATIONS IN TERMS OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002 (MPRDA) (AS AMENDED).

PREPARED BY:

EIMS | ENVIRONMENTAL IMPACT MANAGEMENT SERVICES

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SAMRAD RECORD NUMBER: FS-00061-MR/102

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, 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 to instructions or guidance provided by the Competent Authority to the submission of applications.

It is therefore the instruction that the prescribed reports required in respect of application 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 must process and interpret his/her research and analysis and use the findings thereof to compile the information requested 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 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 activity is located and document how the proposed 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 the technology alternatives on these aspects to determine:

The nature, significance, consequence, extent, duration, and probability of the impacts occurring to; and

The degree to which these impacts-

aa) Can be reversed;

bb) May cause irreplaceable loss of resources; and

cc) 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.

Contents

List of Tables

List of Figures

List of Appendices

Abbreviations

AMSL : Above Mean Sea Level

BAR : Basic Assessment Report

BID : Background Information Document

BGL : Below Ground Level

DMRE : Department of Mineral Resources and Energy

DHSWS : Department of Human Settlement, Water and Sanitation

EA : Environmental Authorisation

EAP : Environmental Assessment Practitioner

EIA : Environmental Impact Assessment

EIMS : Environmental Impact Management Services

EMPr : Environmental Management Programme

GIS : Geographic Information System

I&AP : Interest and Affected Party

MPRDA : Mineral and Petroleum Resources Development Act

NEMA : National Environmental Management Act

NEMWA : National Environmental Management Waste Act

NGA : National Groundwater Archive

NWA : National Water Act

PPP : Public Participation Process

PART A: SCOPE OF ASSESSMENT AND BASIC ASSESSMENT REPORT

1 INTRODUCTION

Harmony Gold Mining Company Limited (hereafter referred to as the applicant) has appointed Environmental Impact Management Services (EIMS) (Pty) Ltd. as Environmental Assessment Practitioner (EAP) to assist with compiling the necessary reports and undertaking the statutory consultation processes in support of applications for:

- Environmental Authorisation (EA) in accordance with the National Environmental Management Act (Act 107 of 1998-NEMA) - Listed activity/ies:
    - GNR 983: Listed Activities: 46; and
    - GNR 985: Listed Activities: 12.
- Water Use Licence (WUL) in accordance with the National Water Act – NWA (Act No. 36 of 1998) –
    - Listed Water uses: Section 21 (c) and Section 21 (i).

The applicant wishes to reclaim the Free State South (FSS) 6 Tailings Storage Facility (TSF) through the Tswelopele Beneficiation Operations (TBO) Saaiplaas Plant. The applicant plans to construct a new reclamation pump station at FSS 6 TSF and slurry transfer pipeline from FSS6 TSF to Brand A Pump Station to transport reclaimed slurry. Once at Brand A, the slurry will be pumped into a sump and transported to the Saaiplaas Plant via an existing pipeline. The proposed slurry pipeline (From FSS6 TSF to Brand A Pump Station) is an expansion of the existing reclamation infrastructure and is approximately 5.9 km in length and will be constructed above ground, within existing servitudes.

This BAR has been designed to meet the requirements for a BAR and Environmental Management Programme (EMPr) as stipulated in the 2014 EIA Regulations (as amended) promulgated under the NEMA. The adjudicating authority for this Application will be the DMRE, and this report has been compiled in accordance with the applicable DMRE guidelines and reporting template.

The proposed linear activity will be located on portions 1 (Re), 1 and 7 of the Farm Klippan 14 Welkom RD; and portions 0, 1, 5, 10 and 15 of the Farm Saaiplaas 690 Ventersburg RD within the Matjhabeng Local Municipality, Free State Province. The proposed pipeline is located approximately 10 km south-east of central Welkom and 8 km north of the town Virginia. The starting point, middle point and ending point of the proposed activity is as follows:

- Start (FSS6 TSF): 28°2'21.21"S and 26°48'33.58"E;
- Middle: 28°1'5.24"S and 26°48'48.57"E; and
- End (Brand A Pump Station): 28°1'25.54"S and 26°49'53.44"E.

A Public Participation Plan (PP Plan) has been prepared and submitted to the competent authority, the DMRE, with the application for EA in accordance with the requirements of the NEMA, and the Directions issued by the Department of Forestry, Fisheries and the Environment (GN 650 of 5 June 2020) in terms of the Disaster Management Act (Act 57 of 2002). The purpose of the PP Plan is to ensure that a successful public participation process is carried out for the duration of the project.

The BAR was made available to Interested and Affected Parties (I&AP's) for comment from the 26th of November 2021 until the 17th of January 2022. All comments received during this period will be included in the BAR for submission to the DMRE for their decision-making process.

1.1 REPORT STRUCTURE

This report has been compiled in accordance with the EIA Regulations, 2014 (Government Notice (GN) R982). A summary of the report structure, and the specific sections that correspond to the applicable regulations, is provided in Table 1 below.

Table 1: Report Structure

Environmental Regulation NEMA EIA Regulations, 2014	Description	Section in Report
Appendix 1(3)(1)(a):	Details of – i) The EAP who prepared the report; and ii) The expertise of the EAP, including a curriculum vitae;	Section 1.2 Section 1.3
Appendix 1(3)(1)(b):	The location of the activity, including: i) The 21-digit Surveyor General code of each cadastral land parcel; ii) Where available, the physical address and farm name; and iii) Where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;	Section 1.4
Appendix 1(3)(1)(c):	A plan which locates the proposed activity or activities applied for as well as the associated structures and infrastructure at an appropriate scale, or, if it is – i) A linear activity, a description, and coordinates of the corridor in which the proposed activity or activities is to be undertaken; ii) On land where the property has not been defined, the coordinates within which the activity is to be undertaken;	Section 1.4
Appendix 1(3)(1)(d):	A description of the scope of the proposed activity, including – i) All listed and specified activities triggered and being applied for; and	Section 2

Environmental Regulation NEMA EIA Regulations, 2014	Description	Section in Report
	ii) A description of the activities to be undertaken including associated structures and infrastructure;	
Appendix 1(3)(1)(e):	A description of the policy and legislative context within which the development is proposed including – i) An identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that are applicable to this activity and have been considered in the preparation of the report; and ii) How the proposed activity complies with and responds to the legislation and policy context plans, guidelines, tools frameworks, and instruments;	Section 3
Appendix 1(3)(1)(f):	A motivation for the need and desirability for the proposed development, including the need and desirability of the activity in the context of the preferred location;	Section 4
Appendix 1(3)(1)(g):	A motivation for the preferred site, activity, and technology alternative;	Section 5
Appendix 1(3)(1)(h):	A full description of the process followed to reach the proposed alternative within the site, including: i) Details of all the alternatives considered; ii) Details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs; iii) A summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them; iv) The environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage, and cultural aspects; v) The impacts and risks identified for each alternative including the nature, significance, consequence, extent, duration, and probability of the impacts, including the degree to which these impacts – aa) Can be reversed;	Section 6 Section 6.1 Section 6.2 Section 6.3 Section 6.4 Section 6.5

Environmental Regulation NEMA EIA Regulations, 2014	Description	Section in Report
	bb) May cause irreplaceable loss of resources; and cc) Can be avoided, managed, or mitigated; The methodology used in determining and ranking the nature, significance, consequences, extent duration and probability of potential environmental impacts and risks associated with the alternatives; Positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological social, economic, heritage and cultural aspects; The possible mitigation measures that could be applied and level of residual risk; The outcome of the site selection matrix; If no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and A concluding statement indicating the preferred alternatives, including preferred location of the activity;	Section 6.6 Section 7 Section 6.8
Appendix 1(3)(1)(i):	A full description of the process undertaken to identify, assess and rank the impacts the activity will impose on the preferred location through the life of the activity, including – i) A description of all environmental issues and risks that were identified during the environmental impact assessment process; and ii) An assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures;	Section 6.5 Section 6.6 Section 6.7 Section 6.8 Section 8
Appendix 1(3)(1)(j):	An assessment of each identified potentially significant impact and risk, including – i) Cumulative impacts; ii) The nature, significance and consequence of the impact and risk; iii) The extent and duration of the impact and risk; iv) The probability of the impact and risk occurring;	Section 8

Environmental Regulation NEMA EIA Regulations, 2014	Description	Section in Report
	v) The degree to which the impact and risk can be reversed; vi) The degree to which the impact and risk may cause irreplaceable loss of resources; and vii) The degree to which the impact and risk can be mitigated;	
Appendix 1(3)(1)(k):	Where applicable, a summary of the findings and impact management measures identified in any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final report;	Section 9
Appendix 1(3)(1)(l):	An environmental impact statement which contains – i) A summary of the key findings of the environmental impact assessment; ii) A map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicting any areas that should be avoided, including buffers; and iii) A summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;	Section 10
Appendix 1(3)(1)(m):	Based on the assessment, and where applicable, impact management measures from specialist reports, the recording of proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr;	Section 11
Appendix 1(3)(1)(n):	Any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation;	Section 12
Appendix 1(3)(1)(o):	A description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed;	Section 13
Appendix 1(3)(1)(p):	A reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;	Section 14

Environmental Regulation NEMA EIA Regulations, 2014	Description	Section in Report
Appendix 1(3)(1)(q):	Where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required, and the date on which the activity will be concluded, and the monitoring requirements finalised;	Section 15
Appendix 1(3)(1)(r):	An undertaking under oath or affirmation by the EAP in relation to: i) The correctness of the information provided in the reports; ii) The inclusion of comments and inputs from stakeholders and I&Ps; iii) The inclusion of inputs and recommendations from the specialist reports where relevant; and iv) Any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties;	Section 26
Appendix 1(3)(1)(s):	Where applicable, details of any financial provisions for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts;	Section 17
Appendix 1(3)(1)(t):	Any specific information that may be required by the competent authority; and	Section 25
Appendix 1(3)(1)(u):	Any other matters required in terms of section 24(4)(a) and (b) of the Act.	Section 18
Appendix 4(1)(1)(a):	Details of – i) The EAP who prepared the EMPr; and ii) The expertise of that EAP to prepare an EMPr, including a curriculum vitae;	Section 1.2
Appendix 4(1)(1)(b):	A detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;	Section 2
Appendix 4(1)(1)(c):	A map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers;	Section 6.4.2 Section 10.2

Environmental Regulation NEMA EIA Regulations, 2014	Description	Section in Report
Appendix 4(1)(1)(d):	A description of the impact management outcomes, including management statements, identifying the impacts and risks that need to be avoided, managed, and mitigated as identified though the environmental impact assessment process for all phases of the development including – i) Planning and design; ii) Construction activities; iii) Rehabilitation of the environment; and v) Where relevant, operation activities;	Section 6.8 Section 8 Section 11
Appendix 4(1)(1)(f):	A description of proposed impact management actions, identifying the manner in which the impact management contemplated in paragraphs (d) will be achieved, and must, where applicable, include actions to – i) Avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation; ii) Comply with any prescribed environmental management standards or practices; iii) Comply with any applicable provisions of the ac regarding closure, where applicable; and iv) Comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable;	Section 11, 20
Appendix 4(1)(1)(g):	The method of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Section 22
Appendix 4(1)(1)(h):	The frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Section 22
Appendix 4(1)(1)(i):	An indication of the persons who will be responsible for the implementation of the impact management actions;	Section 22

Environmental Regulation NEMA EIA Regulations, 2014	Description	Section in Report
Appendix 4(1)(1)(j):	The time periods within which the impact management actions contemplated in paragraph (f) must be implemented;	Section 20.5
Appendix 4(1)(1)(k):	The mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);	Section 22
Appendix 4(1)(1)(l):	A program for reporting on compliance, taking into account the requirements as prescribed by the Regulations;	Section 22
Appendix 4(1)(1)(m):	An environmental awareness plan describing the manner in which – i) The applicant intends to inform his or her employees of any environmental risk which may result from their work; and ii) Risks must be dealt with in order to avoid pollution or the degradation of the environment; and	Section 24
Appendix 4(1)(1)(n):	Any specific information that may be required by the competent authority.	Section 25

1.2 DETAILS OF THE EAP

EIMS was appointed by the Applicant to fulfil the role of Environmental Assessment Practitioner (EAP) to compile this report. The contact details of the EAP's who compiled the report are as follows:

Table 2: EAP Details

Name of Practitioner	Mr Sikhumbuzo Mahlangu (Project Manager/ EAP)
Tel No.:	011 789 7170
Fax No.:	086 571 9047
E-mail:	sk@eims.co.za

1.3 EXPERTISE OF THE EAP

1.3.1 QUALIFICATIONS OF THE EAP

In terms of Regulation 13 of the EIA Regulations, 2014, an independent Environmental Assessment Practitioner (EAP), must be appointed by the applicant to manage the application. EIMS has been appointed by the Applicant as the EAP and is compliant with the definition of an EAP as defined in Regulations 1 and 13 of the EIA Regulations and Section 1 of the NEMA. This includes, inter alia, the requirement that EIMS is:

- Objective and independent;
- Has expertise in conducting EIA's;
- Comply with the NEMA, the Regulations and all other applicable legislation;
- Takes into account all relevant factors relating to the application; and
- Provides full disclosure to the applicant and the relevant environmental authority.

The declaration of independence of the EAP and the Curriculum Vitae (indicating the experience with environmental impact assessment and relevant application processes) of the consultants that were involved in the BAR process and the compilation of this report are attached as Appendix A.

1.3.2 SUMMARY OF EAP'S PAST EXPERIENCE

EIMS is a private and independent environmental management-consulting firm that was founded in 1993. EIMS has in excess of 27 years' experience in conducting EIAs, including many EIA's for mines and mining related projects.

Mr Sikhumbuzo holds a BSc. Master's degree in Zoology (Aquatic Health) from the University of Johannesburg. He is an aquatic and research scientist with over 2 years' experience, and over 10 years' experience as an environmental scientist. He has also completed an advanced course on Tools for Wetland Assessments. His expertise lies mainly in environmental management, auditing, monitoring, surface and ground water quality assessments, bio-monitoring, wetland assessments and reporting. Sikhumbuzo has played a vital role in providing advice on general environmental management issues on site to projects such as Transnet New Multi Product Pipeline (NMPP), Mokolo Crocodile Water Augmentation Project Phase 1 (MCWAP1), Eskom Grootvlei Power Station and Eskom Kusile Power Station Construction Project among others. He has also been involved on numerous projects in the energy, mining and infrastructure development sectors as well as management and preparation of documentation required for Integrated Water Use Licence Applications (IWULA). He has also played a role in assisting and advising various contractors on the practical implementation of Water Use Licences, Environmental Management Plans and conditions of Environmental Authorisations.

1.4 LOCATION OF THE OVERALL ACTIVITY

The table below provides details on the properties that fall within the EA Application Area. The proposed application area is located across several farm portions for which EA is required. The proposed project footprint of the installation of the proposed reclamation pipeline will only be a fraction of the properties on which the activity will take place. Refer to Figure 1 below for the locality map for the proposed activity.

Table 3: Locality Details

Farm Name (s)	The proposed linear activity will be located on portions 1 (Re), 1 and 7 of the Farm Klippan 14 Welkom RD; portions 0, 1, and 15 of the Farm Saaiplaas 690 Ventersburg RD.
Application Area (Ha)	The pipeline footprint is expected to impact on a fraction of the several farm portions (0.59 ha) of which its transverses. The proposed pipeline is approximately 5.9 km in length and will have a corridor width of approximately 1 m.
Magisterial District	Lejweleputswa District Municipality
Distance and direction from nearest town	The proposed pipeline is to be located approximately 10 km south-east of central Welkom and 8 km north of the town Virginia.
21-digit Surveyor General Code for each Portion	F03900000000001400001 F03900000000001400007 F03500000000069000000 F03500000000069000001 F03500000000069000011 F03500000000069000015

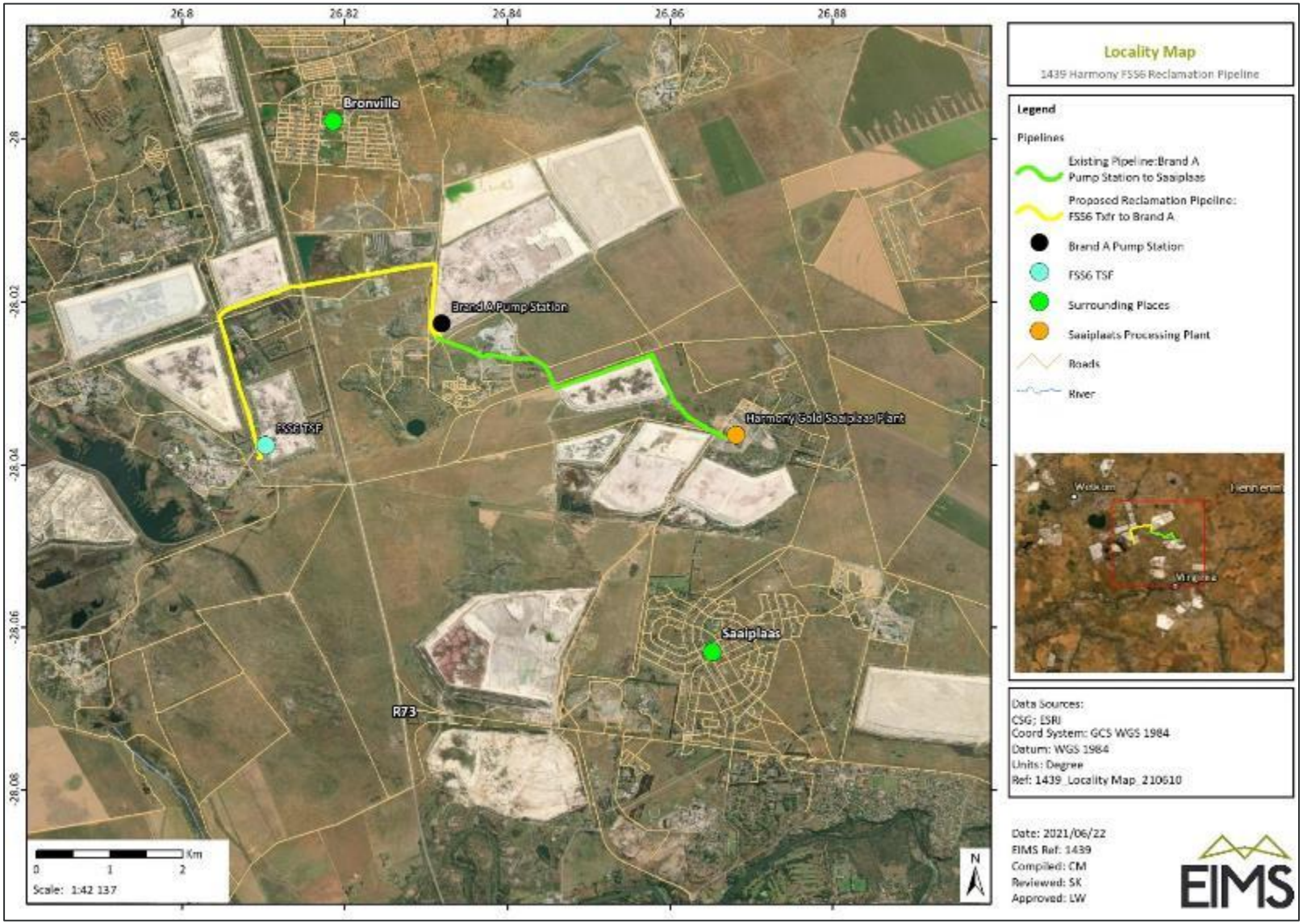

Figure 1: Locality Map for the proposed FSS6 Reclamation Pipeline.

2 SCOPE OF THE PROPOSED ACTIVITY

Harmony Gold Limited has an approved Mining Rights (MR) and Environmental Management Programmes (EMPrs) in terms of the Minerals and Petroleum Resources Development Act (Act 28 of 2002) (MPRDA) for mining of gold at Harmony Merriespruit Virginia Harmony Operation, Unisel, Saaiplaas, Masimong and Brand (MR82), as well as Harmony Bambanani (MR83). The proposed reclamation pipeline aims to transport tailings from the FSS6 TSF located on MR83 through a pipeline for the processing of the tailings at the Saaiplaas Plant located on MR82.

2.1 OVERVIEW OF PROPOSED ACTIVITIES

The applicant wishes to reclaim the FSS6 TSF through the TBO Saaiplaas Plant. The applicant plans to construct a new reclamation pump station at FSS6 TSF and slurry transfer pipeline from FSS6 TSF to Brand A Pump Station to transport reclaimed slurry. Once at Brand A Pump Station, the slurry will then be dropped into a sump from which it will be pumped to the Saaiplaas Plant via an existing pipeline. The proposed slurry pipeline is approximately 5.9 km in length and will be constructed above ground, within existing servitudes. The reclamation pump station will be constructed adjacent to the footprint of FSS6 TSF and consist of offices, pumping and electrical infrastructure. The technical specifications of the proposed slurry pipeline are:

- Transport material – Slurry / Tailings
- Type – Steel (SABS 719 Grade B, with 10mm Cement Mortar Lining (CML))
- Construction – Flanged on plinths
- Flow Rate – 196 l/s
- Length – ± 5 900 m
- Diameter – 0.45 m

Construction of the reclamation pump station is not anticipated to trigger any listed activities due to its limited size and being located in a highly disturbed area. **This application is only for the new pipeline from the FSS6 TSF to the Brand A Pump Station.**

A wetland specialist study was undertaken to delineate watercourses within 500 m of the proposed pipeline in accordance with the DWAF (2005) guidelines. This was done in an effort to access if there was a need for a Water Use Licence Application (WULA) to lodged with the Department of Water and Sanitation (DWS). A heritage impact assessment study was also commissioned to assess the presence of and possible impacts of the proposed pipeline on heritage resources within the area.

2.2 LISTED AND SPECIFIED ACTIVITIES

The proposed reclamation pipeline requires environmental authorisation prior to the commencement of the installation. Table 4 below outlines the anticipated activities applied for in terms of the NEMA for the proposed installation of the reclamation pipeline.

Table 4: Listed and Specified Activities

Name of activity	Aerial extent of the activity	Listed Activity	Applicable listing notice	Environmental authorisation
Construction of a pipeline to transfer tailings	Pipeline is approximately 5 900 metres in length with a diameter of 0.45 m and a flow rate of 196 litres per second.	X	• **GNR 983 Activity 46:** *"The expansion and related operation of infrastructure for the bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes where the existing infrastructure-* *i) has an internal diameter of 0,36 metres or more; or* *ii) has a peak throughput of 120 litres per second or more; and* *a) where the facility or infrastructure is expanded by more than 1 000 metres in length; or* *b) where the throughput capacity of the facility or infrastructure will be increased by 10% or more;* *excluding where such expansion-* *(aa) relates to the bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes within a road reserve or railway line reserve; or* *(bb) will occur within an urban area.*	X
Removal of vegetation for the installation of the pipeline	The proposed pipeline is will transverse several farm portions. However, the footprint of the pipeline will only affect a fraction of the properties. The proposed pipeline is approximately 5.9 km in length. A 0.45 m	X	• **GNR 985: Activity 12** "*The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.* *b. Free State:* *i) Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an*	X

Name of activity	Aerial extent of the activity	Listed Activity	Applicable listing notice	Environmental authorisation
	wide steel pipe is to be constructed above ground.		*area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004;* *ii) Within critical biodiversity areas identified in bioregional plans;* *iii) On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning; or* iv) *Areas within a watercourse or wetland; or within 100 metres from the edge of a watercourse or wetland "* The installation of the proposed pipeline may require the clearance of an area of 300 square metres or more of indigenous vegetation as a portion of the proposed pipeline route falls adjacent to a Critically Biodiverse Area.	

3 POLICY AND LEGISLATIVE CONTEXT

This section provides an overview of the governing legislation and policies identified which relates to the proposed project. Table 5 below describes the applicable policy and legislative context used to compile the BAR.

Table 5: Applicable Policy and Legislative Context

Applicable Legislation and Guidelines	Reference Where Applied (i.e., where in this document has it been explained how the development complies with and responds to the legislation and policy context)	How does this Development Comply with and Respond to the Legislation and Policy Context
National Environmental Management Act (Act No. 107 of 1998) (NEMA) and the EIA Regulations, 2014, as amended	This Basic Assessment Report is prepared as in support of the Application for Environmental Authorisation under the NEMA.	In terms of the NEMA an Application for EA subject to a Basic Assessment Process has been applied for. Activities applied for: • GNR 983 Activity 46; and • GNR 985 Activity 12.
Minerals and Petroleum Resources Development Act (Act No. 28 of 2002) (MPRDA)	The applicant is required to obtain an Environmental Authorisation in terms of Section 5A(b) of the MPRDA. The applicant is in possession of mining rights for the application area.	An application for Environmental Authorisation has been submitted to the DMRE.
National Water Act (Act No. 36 of 1998) (NWA):	Section 20.2 of this report provides detail on applicable water uses.	A Water Use Licence application will be submitted in terms of Section 21 of the NWA. The applicable listed water uses are: Section 21 (c): Impeding or diverting the flow of water in a watercourse; and Section 21 (i): Altering the bed, banks, courses or characteristics of a watercourse.
The National Environmental Management: Biodiversity Act (Act No. 10 of 2004 – NEMBA)	Regulations published under NEMBA provides a list of protected species (flora and fauna), according to the Act (GN R. 151 dated 23 February 2007, as amended in GN R. 1187 dated 14 December 2007) which require a permit in order to be disturbed or destroyed.	No protected species were encountered during the survey. There is no intention to remove any protected specimens and as such, no applications are required in terms of the National Environmental Management: Biodiversity Act. Mitigation measures relating to the management of protected species as well as alien and invasive species are included in Part B: EMPr of this report.

Applicable Legislation and Guidelines	Reference Where Applied (i.e., where in this document has it been explained how the development complies with and responds to the legislation and policy context)	How does this Development Comply with and Respond to the Legislation and Policy Context
National Environmental Management: Waste Act (No. 59 of 2008) **National Environmental Management**	Waste generation	Waste from the installation of the pipeline will not trigger a listed activity in terms of GN 921, Category A, B or C, hence no Waste Management Licence will be applied for.
National Heritage Resources Act (No. 25 of 1999) and Regulations	Section 6.4 Description of the receiving environment including sensitive heritage and palaeontological features as identified by the specialist.	A Heritage and Palaeontology specialist study was undertaken, and sensitive sites recorded on the sensitivity map. Notification of the proposed pipeline has been submitted to the SAHRA.
National Environmental Management: Air Quality Act (No. 39 of 2004) **and** **National Dust Control Regulations (2013)**	Section 8 assesses the impact of the generation of dust during installation of the pipeline	Mitigation measures relating to the management of dust impacts are included Part B: EMPr of this report.
SANS 10103 (Noise Regulations)	Section 8 assesses the impact of noise impacts during installation of the pipeline.	Mitigation measures relating to the management of noise impacts are included Part B: EMPr of this report.
National Forests Act (No. 84 of 1998) and Regulations	Section 6.4 Description of the receiving environment. Removal of protected trees during site clearance for installation of the pipeline.	No protected tree species or forests occur within the installation of the pipeline area and as such no permits are required from the Department of Agriculture, Forestry and Fisheries (DAFF).
Occupational Health and Safety Act (No. 85 of 1993)	Refer to section 20 General duties of employers to their employees	Mitigation measures ensuring the health and safety of employees are included Part B: EMPr of this report.

4 NEED AND DESIRABILITY OF THE PROPOSED ACTIVITIES

The proposed new tailings reclamation pipeline will be installed along the existing pipeline servitudes in order to pump tailings from the FSS6 TSF to the Saaiplaas plant for reclamation purposes. The overall / main objective of this project is to recover residual gold from tailings within the existing FSS6 TSF. The final residue from Saaiplaas Plant tailings will be deposited on the St. Helena 123 TSF.

There are several benefits associated with the reclamation of old TSFs, including but not limited to the removal of a water, land and dust pollution source, as well as costs associated with tailings dam maintenance. Reclamation of the TSF also presents an opportunity to rehabilitate the previously contaminated and sterile land. The land being cleared could be seen as a secondary product and since there will no longer be a need to undertake dust suppression measures on the rehabilitated area, a significant amount of water would be conserved. The safety risks associated with TSFs would also be eliminated with the reclamation of FSS6.

5 MOTIVATION FOR THE OVERALL PREFERRED SITE, ACTIVITIES AND TECHNOLOGY ALTERNATIVE

The proposed project involves the installation of a reclamation / slurry transfer pipeline leading from the FSS6 TSF to the existing Brand A Pump station along existing pipeline servitudes. The assessment of alternative sites considered two possible route alignments, as well as the no-go alternative. The original proposed alignment started the FSS6 TSF and proceeded eastward to the Saaiplaas plant along an existing pipeline servitude (Figure 2). This alignment was abandoned after studies found graves within the proposed servitude and further investigations also revealed that the servitude did not have enough space to accommodate an additional pipeline. An alternative / preferred alignment (Figure 2) was proposed which runs north between two TSFs which are located 1 kilometre west from the R730, then it turns east from where it runs across the R730 and along another TSF and a large refuse dump in the north, then it turns south towards Brand A Pump Station. This alignment is preferred as it is slightly shorter than the original alternative and within existing pipeline servitudes with lesser environmental sensitivities.

Consultation with affected landowners and adjacent landowners has been in order to keep them informed about the proposed project activities as well as to capture any comments and concerns they may have regarding the installation of the pipeline.

6 FULL DESCRIPTION OF THE PROCESS FOLLOWED TO REACH THE PROPOSED PREFERRED ALTERNATIVES WITHIN THE SITE

This section describes the specific site area and the location of site features, having taken into consideration the comments raised by interested and affected parties, and the consideration of alternatives to the initially proposed site layout.

6.1 DETAILS OF DEVELOPMENT FOOTPRINT ALTERNATIVES

The pipeline footprint is expected to impact on fraction of the several farm portions of which its transverses. The proposed pipeline is 5.9 km in length and will have a diameter of 0.45 m. The primary drivers in determining the location of the proposed pipeline includes servitude availability, environmental sensitivities and the existing pipeline servitudes. The proposed pipeline is located approximately 10 km south-east of central Welkom and 8 km north of the town Virginia.

6.1.1 PROPERTY

The properties comprising the installation of the pipeline area as well as the adjacent properties are predominantly characterised by open areas, mining and industrial areas. The proposed pipeline, should it be approved, will be installed within mine access road reserve and an existing pipeline servitude. The proposed alignment is located in a highly modified environment, as such no further assessment of alternative properties

were undertaken. It is not anticipated that the proposed pipeline will affect the continuation of the long-term land uses.

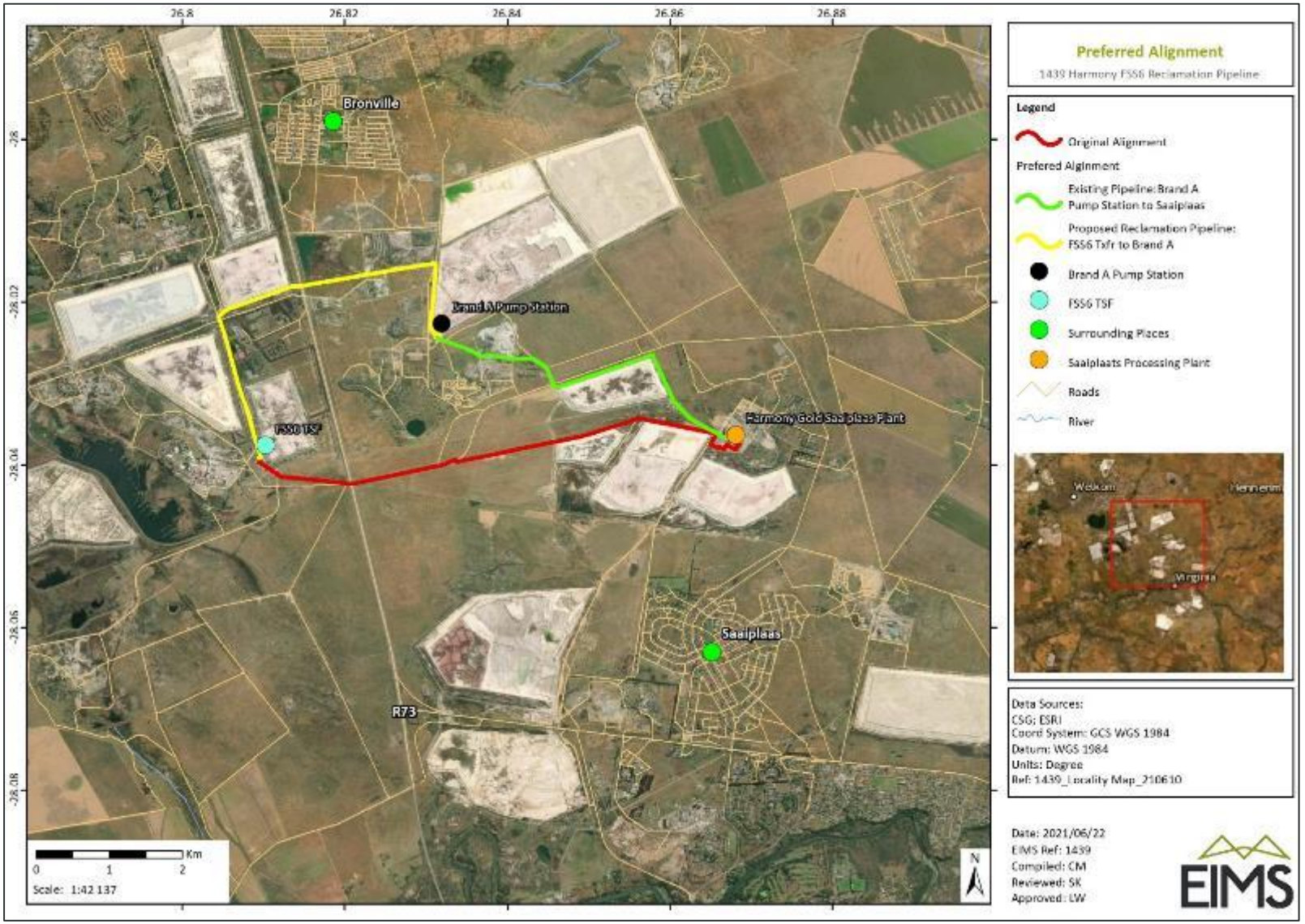

Figure 2: Original alignment vs Preferred alignment.

6.1.2 TYPE OF ACTIVITY

The proposed project involves the installation of a slurry reclamation pipeline between FSS6 TSF and the existing Brand A pump station. Due to the nature and benefits of the proposed activity, no assessment of alternative activities was undertaken.

6.1.3 DESIGN OR LAYOUT

The current layout plan for the proposed project is considered as the preferred layout plan. The layout plan is dictated by the existing location of the TSF, the Brand A pump station and its associated infrastructure. The proposed route is characterised by mining related activities, a poultry farm and a refuse dump. A slurry / reclamation pipeline already exists between Brand A pump station and the Saaiplaas plant. Therefore, no new pipeline will be required between the two. The preferred alignment layout runs north between two TSFs which are located 1 kilometre west from the R730, then it turns east from where it runs across the R730 and along another TSF and a large refuse dump in the north, then it turns south towards Brand A Pump Station. Therefore, no other layout alternative was considered further.

6.1.4 TECHNOLOGY ALTERNATIVES

Process alternatives imply the investigation of alternative processes or technologies that can be used to achieve the same goal. The reclamation pump station will be constructed adjacent to the footprint of FSS6 TSF and consist of offices, pumping and electrical infrastructure. Should the project be granted authorisation, a 450 mm wide steel (SABS 719 Grade B, with 10 mm Cement Mortar Lining (CML)) pipe is to be to be installed above ground flanged on plinths. No alternative technologies were considered in this assessment as the proposed technology is considered the standard practice for a slurry / reclamation pipeline in the area.

6.1.5 OPERATIONAL ASPECTS

The planned activity is the conveyance of reclaimed slurry from the FSS6 TSF to the Brand A pump station. Therefore, no alternative operational aspects were considered in this assessment.

6.1.6 THE “NO-GO” OPTION

The no go alternative would imply that the no new slurry transfer pipeline will be installed, and the status quo remains. The option of the project not proceeding would mean that the environmental impact and social status would remain the same as current. This implies that both negative and positive impacts would not take place. As such, negative impacts on biodiversity, water resources, air quality, land use etc. would continue and also that the positive impacts such as mine residue removals, land rehabilitation, skills development and poverty alleviation would not occur. A negative social impact would also result from the closure of the Saaiplaas plant due to lack of source material.

6.2 DETAILS OF THE PUBLIC PARTICIPATION PROCESS TO BE FOLLOWED

The Public Participation Process (PPP) is a requirement of several pieces of South African Legislation and aims to ensure that all relevant I&AP’s are consulted, involved and their opinions are taken into account and a record included in the reports submitted to Authorities. The process ensures that all stakeholders are provided this opportunity as part of a transparent process which allows for a robust and comprehensive environmental study.

The landowners and other pre-identified key I&AP’s were sent an initial notification letter during October 2021, disseminated via email, fax, and registered mail. I&AP’s were provided an initial registration period to register for the proposed project. Subsequent notifications will be sent as I&APs are identified. All pre-identified and registered I&APs will be notified of the availability of the BAR for review and comment. All comments received during this period will be included in this BAR and submitted to the Commenting Authority. A full description of the PPP will be included in the Comments and Responses Report, which will be attached as Appendix B to this report.

6.2.1 IDENTIFICATION OF I&AP'S

An initial I&AP list was compiled using existing databases and WinDeed searches to determine the contact details of the registered landowners of the project affected properties and surrounding properties. The I&AP database includes amongst others: landowners, communities, regulatory authorities, and other specialist interest groups. Additional I&APs have been registered during the initial notification and call to register period. The I&APs database will continue to be updated throughout the duration of the BA process. A full list of I&APs is attached in Appendix B.

6.2.2 LIST OF AUTHORITIES IDENTIFIED AND NOTIFIED

The following authorities have been identified and notified, but not limited to:

- Department Mineral Resources and Energy;
- Lejweleputswa District Municipality;
- Matjhabeng Local Municipality;
- Free State Department of Agriculture and Rural Development;
- Free State Department of Cooperative Governance and Traditional Affairs;
- Free State Department of Public Works and Infrastructure;
- Free State Department of Police, Roads and Transport;
- Free State Department of Economic, Small Business Development, Tourism and Environmental Affairs;
- Free State Development Corporation;
- National Department of Transport;
- National Department of Forestry, Fisheries and the Environment;
- National Department Of Agriculture, Land Reform And Rural Development;
- National Department of Mineral Resources and Energy;
- National Department of Rural Development and Land Reform;
- National Department of Water and Sanitation; and
- South African Heritage Resources Agency (SAHRA).

6.2.3 LIST OF KEY STAKEHOLDERS IDENTIFIED AND NOTIFIED

The following key stakeholders have been identified and notified of the proposed FSS6 Reclamation Pipeline Project:

- Eskom Holdings Soc. Ltd;
- Transnet Soc Ltd;
- South African National Biodiversity Institute (SANBI);
- South African National Roads Agency Ltd: Eastern Region;
- Vrystaat Landbou/ Free State Agriculture (Provincial Affiliate of the AgriSA)
- Birdlife SA;
- Free State Wetland Forum;
- WESSA: Northern Area;
- Matjhabeng Ratepayers Association;
- Matjhabeng Publicity Association; and
- Local Ward Councillor.

Refer to Appendix B for the full list of I&APs.

6.2.4 LIST OF SURROUNDING SURFACE RIGHTS HOLDERS/LANDOWNERS IDENTIFIED

The following surrounding surface rights holders/landowners of the area under application have been identified of the proposed FSS6 Reclamation Pipeline EA application:

- Samada Diamante Pty Ltd;
- Steenwyk Pty Ltd;
- Willow Valley Poultry Farm;

The I&AP database is included in Appendix B.

6.2.5 NOTIFICATION OF I&AP'S

All I&AP's were notified of the EA Application via the following one or more of the following methods:

- Registered letters, emails and/or faxes where available;
- Placement of English, SeSotho and Afrikaans A1 Correx Site Notices in various locations within and surrounding the proposed project area;
- Placement of a newspaper advert in the Vista Newspaper.

Refer to Appendix B for proof of notification sent to I&APs and for proof of correspondence with I&APs. Notification documents sent to all pre-identified I&AP's included the following information:

- The proposed project area;
- List of activities to be authorised;
- Scale, nature, and extent of activities to be authorised;
- Sufficient detail of the intended operation to enable them to assess what impact the activities will have on them or on the use of their land;
- The purpose of the proposed project;
- Details of the affected properties (including parent farm and portion);
- Details of the NEMA Regulations that must be adhered to;
- Date by which comment, concerns and objections must be forwarded through to EIMS; and
- Contact details of the Environmental Assessment Practitioner (EAP).

I&AP's were provided an opportunity to register as I&AP's for the proposed project from the 13th of October 2021 until the 15th of November 2021. I&AP's were also notified of the availability of the BAR which has been made available for 30 days from the 26th of November 2021 until the 17th of January 2022, for review and comment. Comments obtained during the BAR public review and comment period and the responses will be included in the final submission to the DMRE.

6.3 SUMMARY OF ISSUES RAISED BY I&AP'S

Any comments received during the PPP to date will be included in Appendix B. Refer to the I&AP database in Appendix B for a full list of pre-identified and registered interested and affected parties. This section will be updated post the review of the BAR and associated appendices for submission to the DMRE.

6.4 THE ENVIRONMENTAL ATTRIBUTES ASSOCIATED WITH THE ALTERNATIVES

6.4.1 SOCIO-ECONOMIC CONTEXT

The proposed FSS6 TSF Reclamation Pipeline Project will be situated on several farm portions as identified in Figure 1. The proposed linear activity is to be located approximately 10 km south-east of central Welkom and 8 km north of the town Virginia. The application area falls within the Matjhabeng Local Municipality (MLM), Lejweleputswa District Municipality (LDM) in the Free State Province.

Matjhabeng LM is one of five local municipalities within the LDM covering an area of approximately 5 690 km^2. Its major cities are Allanridge, Hennenman, Odendaalsrus, Ventersburg, Virginia and Welkom. It is bound by Nala to the north, Masilonyana to the south, Tswelopele to the east and Moqhaka to the west. Matjhabeng represents the hub of mining activity in the Free State Province.

According to 2011 Census, the Matjhabeng LM had a total population of 406 461people, of which 87.70% are black African. The coloured population makes up 2,1%, and 9,6% are white. In terms of education, Of the people aged 20 and older, 38,8% have some form of secondary schooling and only 28,1% have matric. In the municipality, 4,6% of people have no schooling and 14% have some form of primary schooling.

The main economic activities within the LM are mining and manufacturing. A total of 99 650 people are employed while 13 290 are discouraged work-seekers. According to Census 2011, 58 524 people are unemployed; making the unemployment rate stand at 37%. Of the youth aged 15–34, 39 442 are employed and 38 975 are unemployed.

There are 123 195 households in the Matjhabeng LM, with an average household size of 3,1 persons per household. Of those households, 36% have access to piped water inside the yard whereas 54,8% have access to piped water inside their dwelling. Only 2% of the households do not have access to piped water.

6.4.2 TYPE OF ENVIRONMENT AFFECTED BY THE PROPOSED ACTIVITY

This section of the report has been compiled with input from various specialists that were appointed to undertake the specialist assessments for the application area. Refer to Appendix D for a copy of the specialist reports undertaken. The following specialist studies were undertaken:

- Wetland Assessment and Hydropedology statement - The Biodiversity Company; and
- Heritage and Palaeontological Impact Assessment - PGS Heritage.

6.4.2.1 TERRAIN

The terrain of the 500 m regulated area has been analysed to determine potential areas where wetlands are more likely to accumulate (due to convex topographical features, preferential pathways, or more gentle slopes). Hydropedologically, this data is crucial in understanding the dynamics of the hillslopes associated with the area.

As shown in Figure 4, a Digital Elevation Model (DEM) has been created to identify lower laying regions as well as potential convex topographical features which could point towards preferential flow paths. The 500 m regulated area ranges from 1 340 to 1 411 Metres Above Sea Level (MASL). The lower laying areas (generally represented in dark blue) represent area that will have the highest potential to be characterised as wetlands (Figure 4).

The slope percentage of the 500 m regulated area is illustrated in Figure 5. The slope percentage ranges from 0 to 50%, with majority of the 500 m regulated area being characterised by a gentler slope (between 0 and 2%). This indicates the presence of steep tailings throughout the 500 m regulated area, with the proposed pipeline located on a gentle slope of mostly 0-2%.

6.4.2.2 CLIMATE

This region is characterised by a warm-temperate summer rainfall climate with the average annual precipitation being approximately 530 mm (Figure 3). High summer temperatures are common for this region with severe frost occurring throughout the winter (on average 37 days per year) (Mucina & Rutherford, 2006) (Figure 3 below).

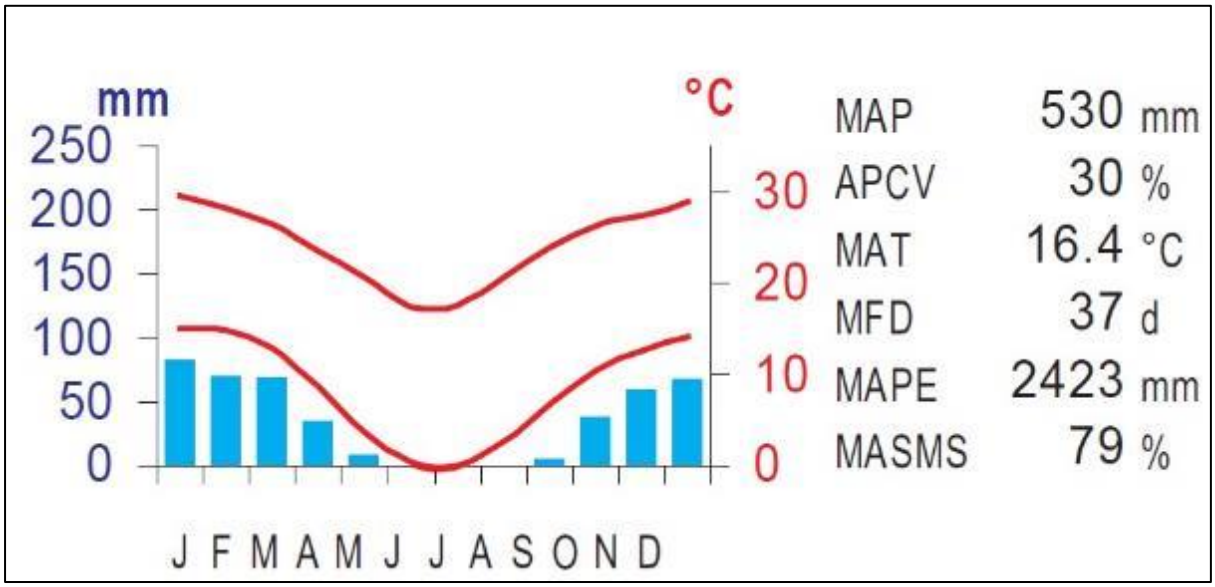

Figure 3: Climate Diagram for the region (Mucina and Rutherford, 2006)

6.4.2.3 GEOLOGY AND SOILS

The geology of this area is characterised by aeolian and colluvial sand which overlies mudstone, sandstone and shale of the Karoo Supergroup. Older Ventersdorp Supergroup basement gneiss and andesite is located to the north. Soil forms associated with the project area includes the Bd, Bc, Ae and Ba land types, which correlates with the findings from the land type database (Mucina and Rutherford, 2006).

6.4.2.4 WETLANDS

This spatial dataset is part of the South African Inventory of Inland Aquatic Ecosystems (SAIIAE) which was released as part of the National Biodiversity Assessment (NBA) 2018. National Wetland Map 5 includes inland wetlands and estuaries, associated with river line data and many other datasets within the South African Inventory of Inland Aquatic Ecosystems (SAIIAE, 2018).

One natural wetland system was identified within the 500 m radius of the development area, which has been classified as a depression (Figure 6). This system is located in the centre portion of the 500 m regulated area approximately 300 m south of the pipeline. Various NFEPA wetlands were identified, of which the majority of systems have been classified as being artificial. Wetlands cover 5.5% of the Matjhabeng Municipality.

6.4.2.5 VEGETATION TYPE

The project area falls within the Vaal-Vet Sandy Grassland (Gh10) vegetation type (Figure 7). This vegetation type is distributed throughout North-West and Free State and stretches from south of Lichtenburg to Klerksdorp, Bothaville, Leeudoringstad as well as Brandfort. The latitude suited for this vegetation type is between 1 260 meters above sea level to 1 360 meters above sea level (Mucina & Rutherford, 2006).

This vegetation type features in areas dominated by plains with scattered and undulating hills. These areas mainly comprise of low-tussock grasslands with *Themeda triandra* being one of the most important features of this vegetation type. Overgrazing and erratic rainfall have however ensured that *Themeda triandra* is often replaced with *Elionurus muticus, Aristida congesta* and *Cymbopogon pospischilii* (Mucina & Rutherford, 2006).

The conservation status of this vegetation type is endangered with only 0.3% of it being protected within the Bloemhof Dam, Sandveld, Schoonspruit, Wolwespruit, Soetdoring and Faan Meintjes nature reserves (Mucina & Rutherford, 2006).

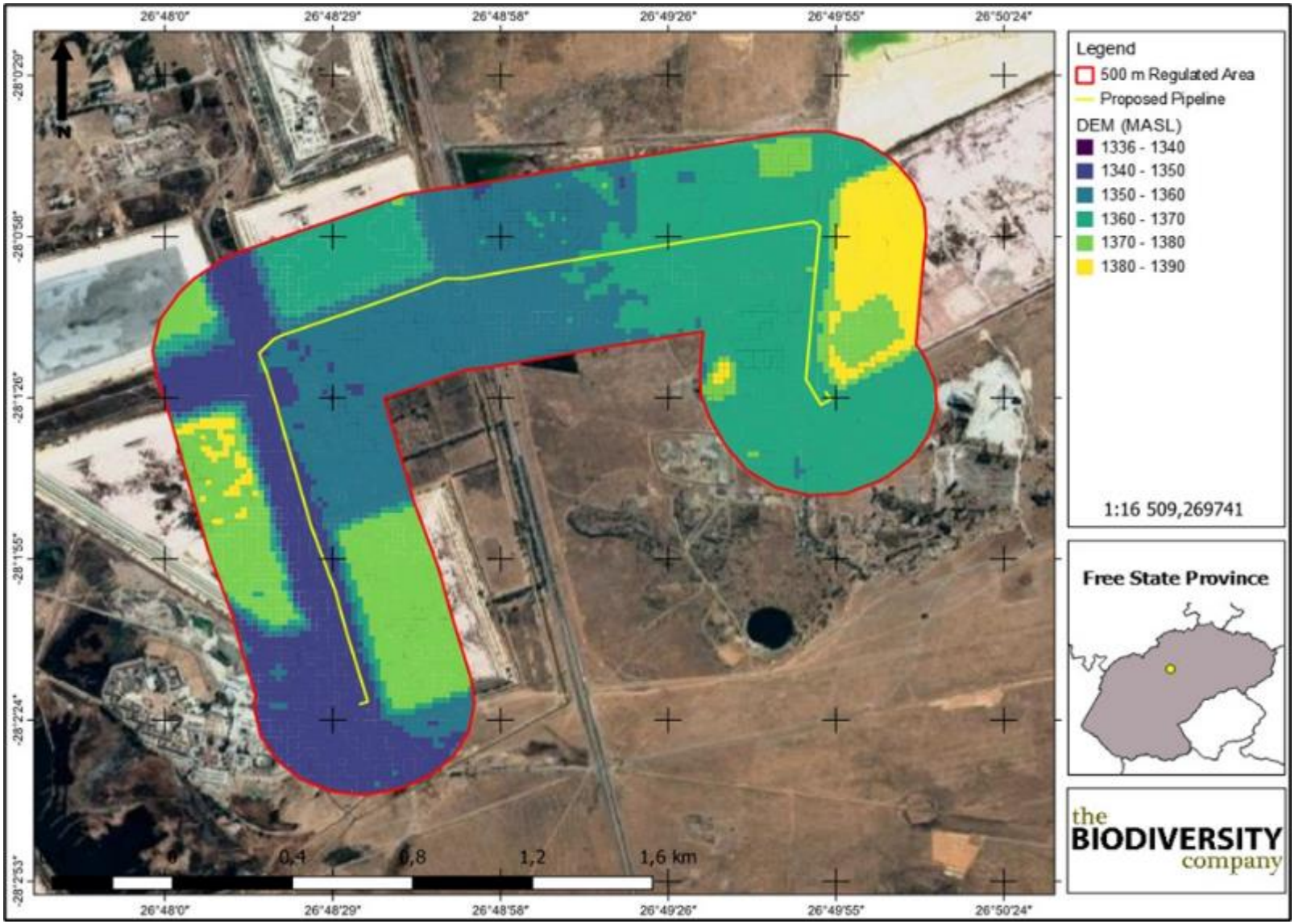

Figure 4: Map showing the digital elevation profile of the proposed project area.

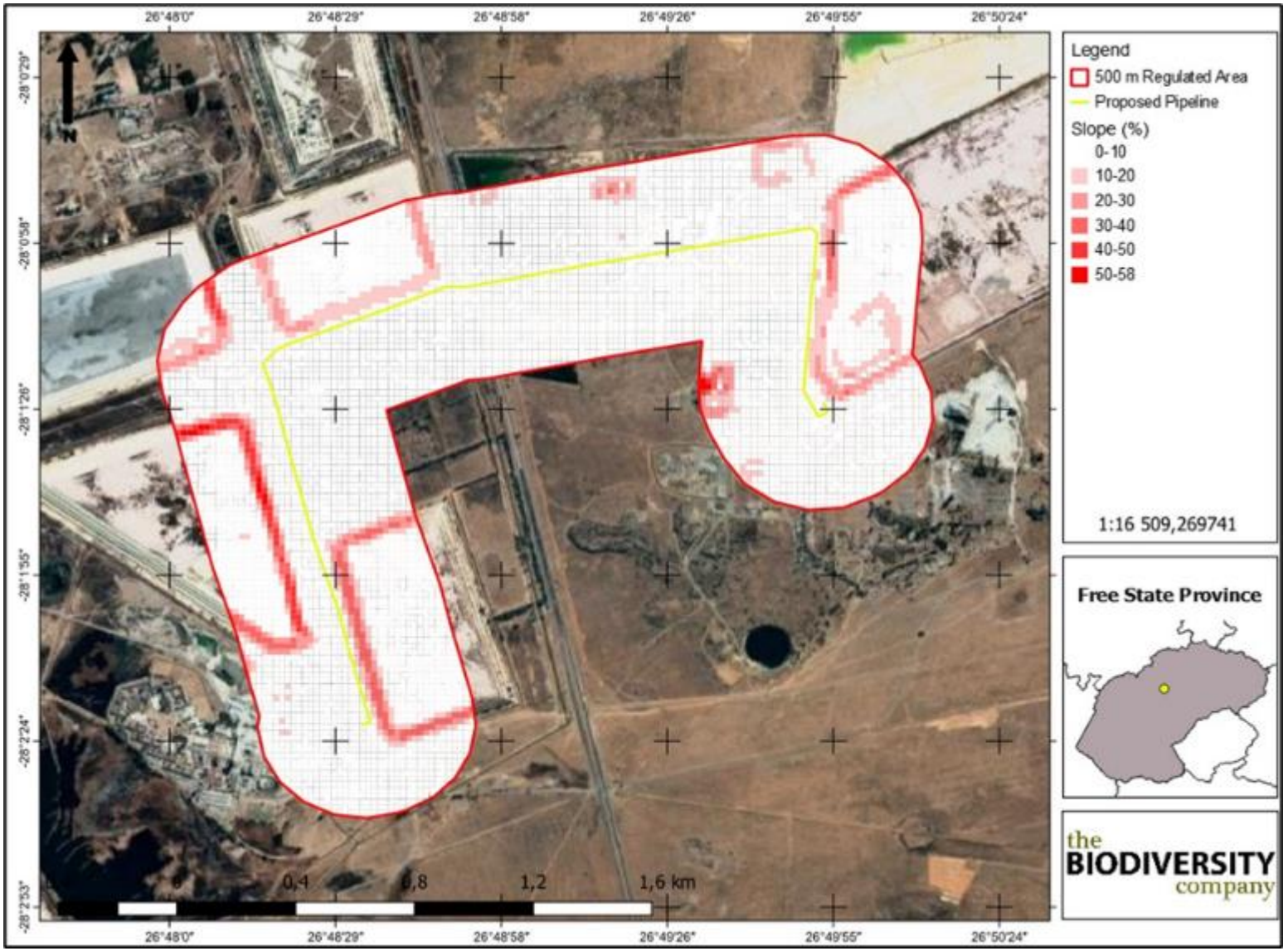

Figure 5: Map illustrating the slope percentage for the proposed pipeline area.

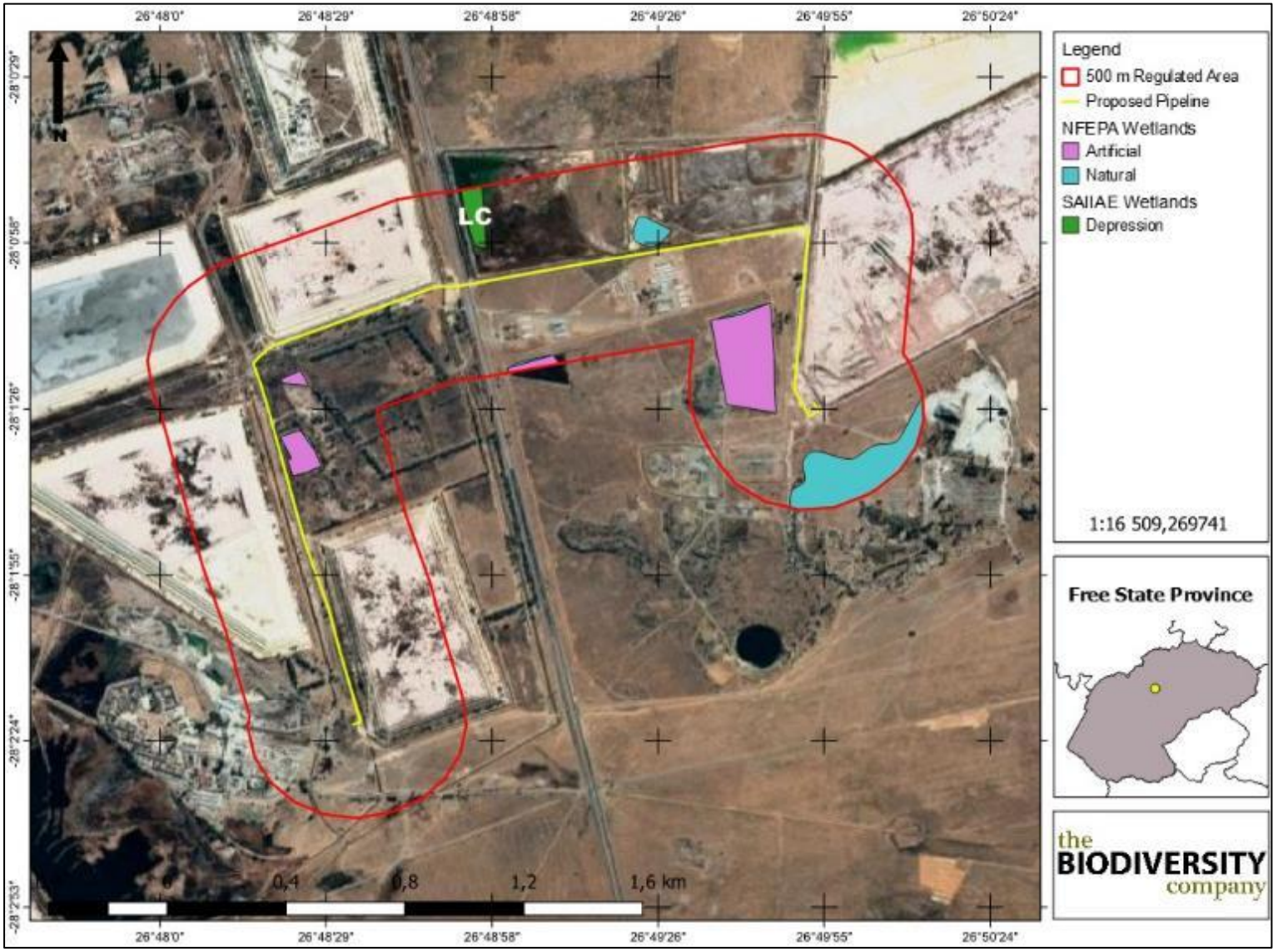

Figure 6: NFEPA and SAIIAE wetlands located within the 500 m regulated area

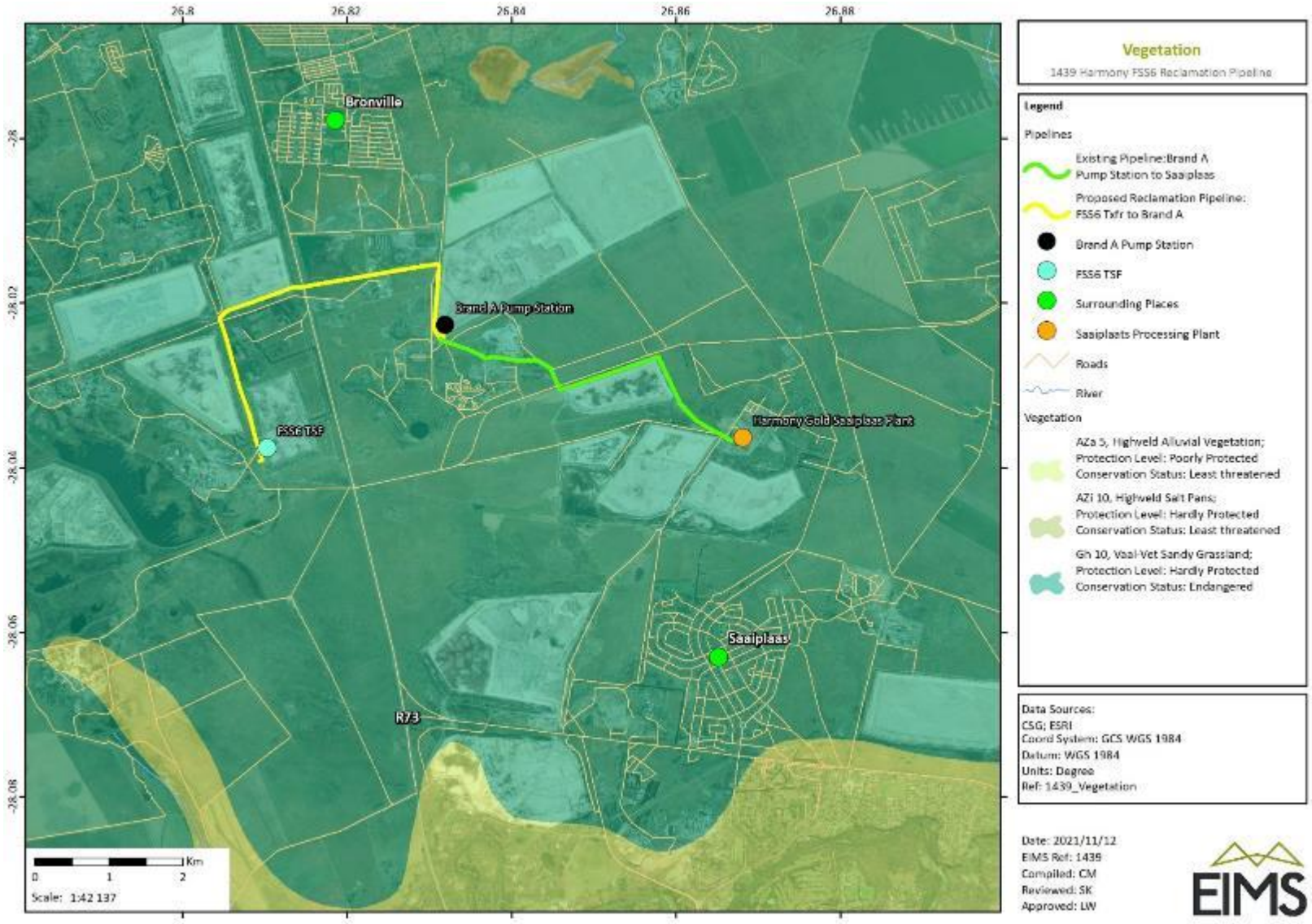

Figure 7: Map illustrating the vegetation types of the project area.

6.4.2.6 ECOSYSTEM PROTECTION LEVEL AND THREAT STATUS

Ecosystem threat status outlines the degree to which ecosystems are still intact or alternatively losing vital aspects of their structure, function, and composition, on which their ability to provide ecosystem services ultimately depends (Skowno et al., 2019). Ecosystem types are categorised as Critically Endangered (CR), Endangered (EN), Vulnerable (VU) or Least Threatened (LT), based on the proportion of each ecosystem type that remains in good ecological condition (Skowno et al., 2019). The project area was superimposed on the terrestrial ecosystem threat status (Figure 8). As seen in this figure, the project area is situated within an ecosystem that is listed as EN. There is one endangered ecosystem, the Vaal-Vet Sandy Grassland covering 11% of the Matjhabeng Municipality.

Ecosystem protection level tells us whether ecosystems are adequately protected or under protected. Ecosystem types are categorised as not protected, poorly protected, moderately protected, or well protected, based on the proportion of each ecosystem type that occurs within a protected area recognised in the Protected Areas Act (Skowno et al., 2019).

The project area was superimposed on the ecosystem protection level map to assess the protection status of terrestrial ecosystems associated with the development (Figure 9). Based on Figure 9, the terrestrial ecosystem associated within the assessment area is rated as 'Hardly Protected'.

There is one formal land-based protected area in the Matjhabeng municipality, being the Willem Pretorius Nature Reserve. Grassland is the one biome in the Matjhabeng Municipality. Seven vegetation types are found, namely Bloemfontein Karroid Shrubland, Central Free State Grassland, Highveld Alluvial Vegetation, Highveld Salt Pans, Vaal-Vet Sandy Grassland, Western Free State Clay Grassland and Winburg Grassy Shrubland.

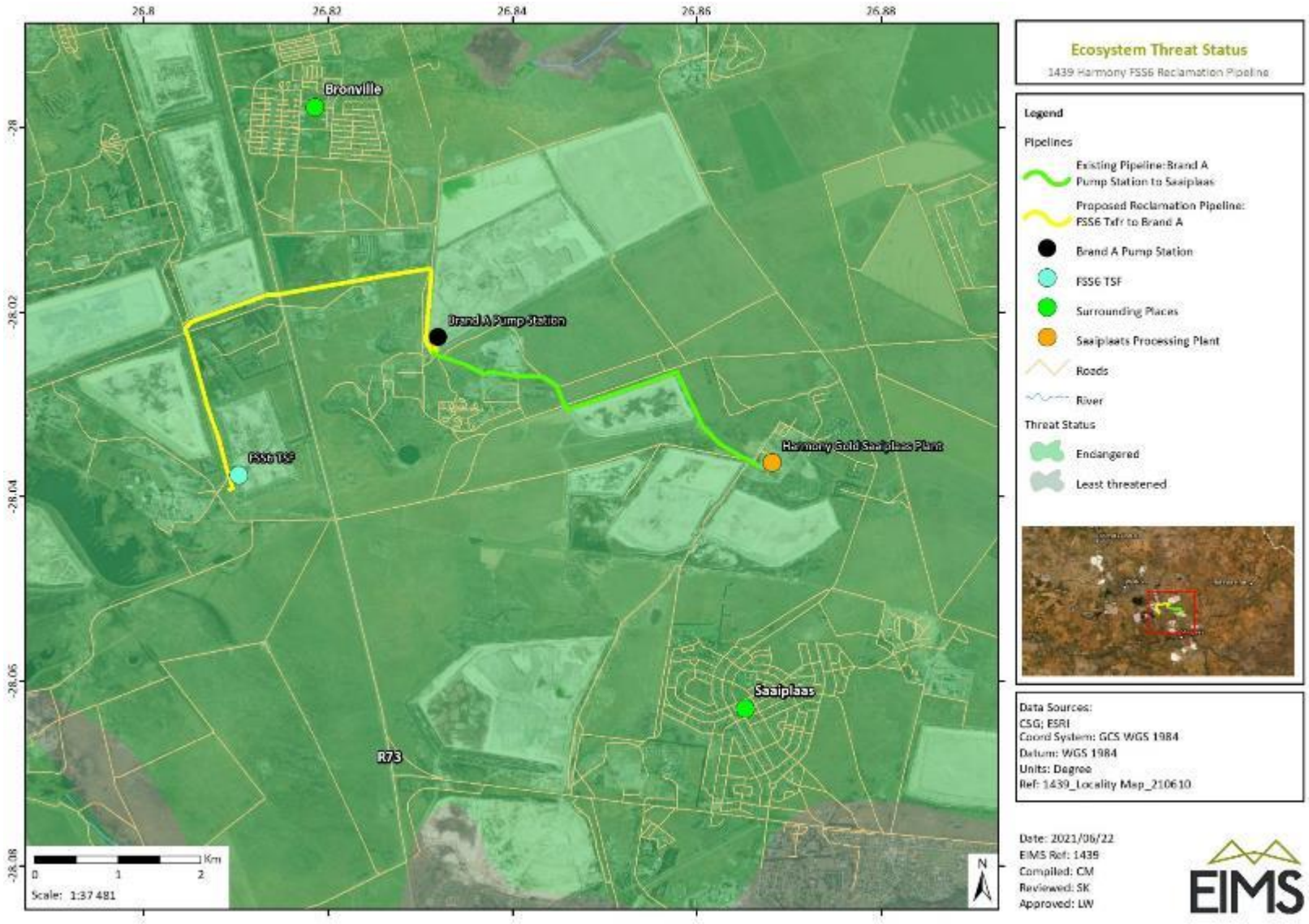

Figure 8: Map illustrating the Ecosystem Threat Status of the terrestrial ecosystem within the project area.

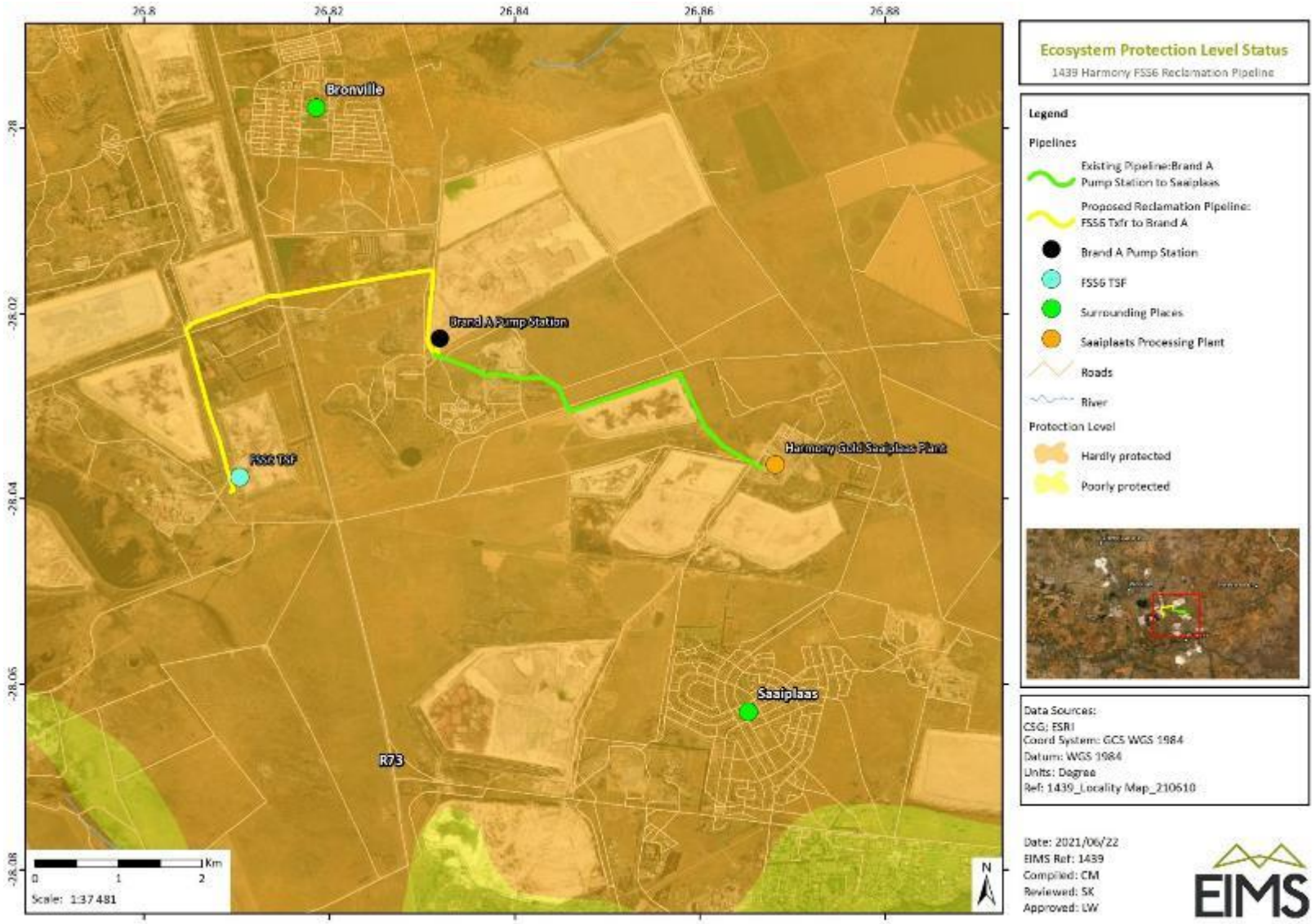

Figure 9: Map illustrating the Ecosystem Protection Level of the terrestrial ecosystem within the project area.

6.4.2.7 RAMSAR SITES & WORLD HERITAGE SITES

No Ramsar sites or World heritage sites are located within the project area.

6.4.2.8 VEGETATION ASSESSMENT

The project area falls within the Vaal-Vet sandy grassland (Gh10) vegetation type. this vegetation type is distributed throughout North-West and Free State and stretches from south of Lichtenburg to Klerksdorp, Bothaville, Leeudoringstad as well as Brandfort. The latitude suited for this vegetation type is between 1 260 meters above sea level to 1 360 meters above sea level (Mucina & Rutherford, 2006).

6.4.2.8.1 ALIEN AND INVASIVE PLANTS

Declared weeds and invader plant species have the tendency to dominate or replace the canopy or herbaceous layer of natural ecosystems, thereby transforming the structure, composition, and function of these systems. Therefore, it is important that these plants are controlled and eradicated by means of an eradication and monitoring programme. Some invader plants may also degrade ecosystems through superior competitive capabilities to exclude native plant species.

The NEMBA is the most recent legislation pertaining to alien invasive plant species. In August 2014, the list of Alien Invasive Species was published in terms of the NEMBA. The Alien and Invasive Species Regulations were published in the Government Gazette No. 37886, 1 August 2014, and was amended in February 2018 in the Government Gazette No. 41445. The legislation calls for the removal and / or control of alien invasive plant species (Category 1 species). In addition, unless authorised thereto in terms of the NWA, no land user shall allow Category 2 plants to occur within 30 meters of the 1:50 year flood line of a river, stream, spring, natural channel in which water flows regularly or intermittently, lake, dam, or wetland. Category 3 plants are also prohibited from occurring within proximity to a watercourse.

Below is a brief explanation of the three categories in terms of the NEMBA:

- Category 1a: Invasive species requiring compulsory control. Remove and destroy. Any specimens of Category 1a listed species need, by law, to be eradicated from the environment. No permits will be issued.
- Category 1b: Invasive species requiring compulsory control as part of an invasive species control programme. Remove and destroy. These plants are deemed to have such a high invasive potential that infestations can qualify to be placed under a government sponsored invasive species management programme. No permits will be issued.
- Category 2: Invasive species regulated by area. A demarcation permit is required to import, possess, grow, breed, move, sell, buy, or accept as a gift any plants listed as Category 2 plants. No permits will be issued for Category 2 plants to exist in riparian zones.
- Category 3: Invasive species regulated by activity. An individual plant permit is required to undertake any of the following restricted activities (import, possess, grow, breed, move, sell, buy, or accept as a gift) involving a Category 3 species. No permits will be issued for Category 3 plants to exist in riparian zones.

Note that according to the regulations, a person who has under his or her control a category 1b listed invasive species must immediately:

- Notify the competent authority in writing; and
- Take steps to manage the listed invasive species in compliance with:
    - Section 75 of the Act;
    - The relevant invasive species management programme developed in terms of regulation 4; and

- Any directive issued in terms of section 73(3) of the Act.

Very limited natural vegetation was encountered within the project area during the field survey. Some alien and/or invasive plants were recorded during the field survey within the project area. It is recommended that an Alien Plant Species Management Plan be implemented within the project areas in order to prevent the project activities and movement exacerbating the infestation.

6.4.2.9 CULTURAL AND HERITAGE

PGS Heritage (Pty) Ltd (PGS) was appointed by EIMS to undertake a Heritage Impact Assessment (HIA) for the proposed FSS6 TSF reclamation pipeline. A controlled surface survey was conducted on foot and by a vehicle by two archaeologists from PGS. The fieldwork was conducted on the 5th of October 2021. The heritage impact assessment and desktop palaeontological impact assessment did not identify any heritage / palaeontological resources within the study area.

6.4.3 DESCRIPTION OF CURRENT LAND USES

The proposed development is approximately 10 km south-east of central Welkom and 8 km north of the town Virginia. The project area is predominately mining development and industrial activities. Other dominant land uses in the project area include the R730 road which bisects proposed project area in the middle, as well as existing pipeline servitudes. The proposed properties are expected to be generally flat (refer to Figure 4 and Figure 5), with a few steep TSFs in adjacent properties. The area is predominantly characterised by TSFs from the Harmony Gold mining activities in the area.

6.4.4 DESCRIPTION OF SPECIFIC ENVIRONMENTAL FEATURES AND INFRASTRUCTURE ON SITE

The most notable infrastructure located within the application area includes the following:

- Mining developments (TSFs);
- Power Lines;
- Pipeline Servitudes;
- Dirt Roads;
- Poultry Farm; and
- Refuse Dump.

6.5 IMPACTS AND RISKS IDENTIFIED

In order to calculate the significance of an impact the probability, duration, extent, and magnitude will be assessed. The pre- and post-mitigation scores will provide an indication of the extent to which an impact can be successfully mitigated.

Potential impacts that may occur as a result of the proposed installation of the pipeline are:

- Loss and fragmentation of vegetation;
- Erosion;
- Introduction of alien plant species;
- Displacement of faunal community;
- Impact on heritage resources;
- Impact on palaeontological resources;

- Compaction;
- Altering surface hydrology;
- Noise;
- Pollution of soils;
- Pollution of surface and ground water;
- Air quality (dust);
- Interference with existing land uses;
- Waste management; and
- Limited Job Creation.

6.6 THE IMPACT ASSESSMENT METHODOLOGY

The impact significance rating methodology, as provided by EIMS, is guided by the requirements of the NEMA EIA Regulations, 2014. The broad approach to the significance rating methodology is to determine the environmental risk (ER) by considering the consequence (C) of each impact (comprising Nature, Extent, Duration, Magnitude, and Reversibility) and relate this to the probability/ likelihood (P) of the impact occurring. This determines the environmental risk. In addition, other factors, including cumulative impacts, public concern, and potential for irreplaceable loss of resources, are used to determine a prioritisation factor (PF) which is applied to the ER to determine the overall significance (S).

The significance (S) of an impact is determined by applying a prioritisation factor (PF) to the environmental risk (ER). The environmental risk is dependent on the consequence (C) of the particular impact and the probability (P) of the impact occurring. Consequence is determined through the consideration of the Nature (N), Extent (E), Duration (D), Magnitude (M), and reversibility (R) applicable to the specific impact.

For the purpose of this methodology the consequence of the impact is represented by:

$$\boldsymbol{C = \frac{(E + D + M + R) * N}{4}}$$

Each individual aspect in the determination of the consequence is represented by a rating scale as defined in Table 6.

Table 6: Criteria for determination of impact consequence

Aspect	Score	Definition
Nature	- 1	Likely to result in a negative/ detrimental impact
	+1	Likely to result in a positive/ beneficial impact
Extent	1	Activity (i.e., limited to the area applicable to the specific activity)
	2	Site (i.e., within the development property boundary)
	3	Local (i.e., the area within 5 km of the site)
	4	Regional (i.e., extends between 5 and 50 km from the site)
	5	Provincial / National (i.e., extends beyond 50 km from the site)

Aspect	Score	Definition
Duration	1	Immediate (<1 year)
	2	Short term (1-5 years)
	3	Medium term (6-15 years)
	4	Long term (15-65 years, the impact will cease after the operational life span of the project)
	5	Permanent (>65 years, no mitigation measure of natural process will reduce the impact after construction)
Magnitude/ Intensity	1	Minor (where the impact affects the environment in such a way that natural, cultural, and social functions and processes are not affected)
	2	Low (where the impact affects the environment in such a way that natural, cultural, and social functions and processes are slightly affected)
	3	Moderate (where the affected environment is altered but natural, cultural, and social functions and processes continue albeit in a modified way, moderate improvement for +ve impacts)
	4	High (where natural, cultural, or social functions or processes are altered to the extent that it will temporarily cease, high improvement for +ve impacts)
	5	Very high / do not know (where natural, cultural or social functions or processes are altered to the extent that it will permanently cease, substantial improvement for +ve impacts)
Reversibility	1	Impact is reversible without any time and cost.
	2	Impact is reversible without incurring significant time and cost.
	3	Impact is reversible only by incurring significant time and cost.
	4	Impact is reversible only by incurring prohibitively high time and cost.
	5	Irreversible Impact.

Once the C has been determined the ER is determined in accordance with the standard risk assessment relationship by multiplying the C and the P. Probability is rated/scored as per Table 7.

Table 7: Probability scoring

Probability	1	Improbable (the possibility of the impact materialising is very low as a result of design, historic experience, or implementation of adequate corrective actions; <25%),

	2	Low probability (there is a possibility that the impact will occur; >25% and <50%),
	3	Medium probability (the impact may occur; >50% and <75%),
	4	High probability (it is most likely that the impact will occur- > 75% probability), or
	5	Definite (the impact will occur),

The result is a qualitative representation of relative ER associated with the impact. ER is therefore calculated as follows:

$$ER = C \times P$$

Table 8: Determination of environmental risk

Consequence	5	5	10	15	20	25
	4	4	8	12	16	20
	3	3	6	9	12	15
	2	2	4	6	8	10
	1	1	2	3	4	5
		1	2	3	4	
	Probability					

The outcome of the environmental risk assessment will result in a range of scores, ranging from 1 through to 25. These ER scores are then grouped into respective classes as described in Table 9.

Table 9: Significance classes

ER Score	Description
<9	Low (i.e., where this impact is unlikely to be a significant environmental risk/ reward).
≥9 ≤17	Medium (i.e., where the impact could have a significant environmental risk/ reward),
>17	High (i.e., where the impact will have a significant environmental risk/ reward).

The impact ER will be determined for each impact without relevant management and mitigation measures (pre-mitigation), as well as post implementation of relevant management and mitigation measures (post-mitigation). This allows for a prediction in the degree to which the impact can be managed/ mitigated.

In accordance with the requirements of Appendix 13. (1) of the EIA Regulations, 2014, and further to the assessment criteria presented above it is necessary to assess each potentially significant impact in terms of:

- Cumulative impacts; and
- The degree to which the impact may cause irreplaceable loss of resources.

To ensure that these factors are considered, an impact prioritisation factor (PF) will be applied to each impact ER (post-mitigation). This prioritisation factor does not aim to detract from the risk ratings but rather to focus the attention of the decision-making authority on the higher priority/significance issues and impacts. The PF will be applied to the ER score based on the assumption that relevant suggested management/mitigation impacts are implemented.

Table 10: Criteria for Determining Prioritisation

Cumulative Impact (CI)	Low (1)	Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely that the impact will result in spatial and temporal cumulative change.
	Medium (2)	Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is probable that the impact will result in spatial and temporal cumulative change.
	High (3)	Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is highly probable/definite that the impact will result in spatial and temporal cumulative change.
Irreplaceable loss of resources (LR)	Low (1)	Where the impact is unlikely to result in irreplaceable loss of resources.
	Medium (2)	Where the impact may result in the irreplaceable loss (cannot be replaced or substituted) of resources but the value (services and/or functions) of these resources is limited.
	High (3)	Where the impact may result in the irreplaceable loss of resources of high value (services and/or functions).

The value for the final impact priority is represented as a single consolidated priority, determined as the sum of each individual criteria represented in To ensure that these factors are considered, an impact prioritisation factor (PF) will be applied to each impact ER (post-mitigation). This prioritisation factor does not aim to detract from the risk ratings but rather to focus the attention of the decision-making authority on the higher priority/significance issues and impacts. The PF will be applied to the ER score based on the assumption that relevant suggested management/mitigation impacts are implemented.

Table 10: Criteria for Determining Prioritisation

The impact priority is therefore determined as follows:

Priority = PR + CI + LR

The result is a priority score which ranges from 2 to 6 and a consequent PF ranging from 1 to 1.5 (refer to Table 11).

Table 11: Determination of prioritisation factor

Priority	Prioritisation Factor
2	1
3	1.125
4	1.25

Priority	Prioritisation Factor
5	1.375
6	1.5

In order to determine the final impact significance, the PF is multiplied by the ER of the post mitigation scoring. The ultimate aim of the PF is an attempt to increase the post mitigation environmental risk rating by a factor of 0.5, if all the priority attributes are high (i.e., if an impact comes out with a high medium environmental risk after the conventional impact rating, but there is significant cumulative impact potential and significant potential for irreplaceable loss of resources, then the net result would be to upscale the impact to a high significance).

Table 12: Environmental Significance Rating

Significance Rating	Description
<-17	High negative (i.e., where the impact must have an influence on the decision process to develop in the area).
≥-17, ≤-9	Medium negative (i.e., where the impact could influence the decision to develop in the area).
>-9, < 0	Low negative (i.e., where this impact would not have a direct influence on the decision to develop in the area).
0	No impact
>0, <9	Low positive (i.e., where this impact would not have a direct influence on the decision to develop in the area).
≥9, ≤17	Medium positive (i.e., where the impact could influence the decision to develop in the area).
>17	High positive (i.e., where the impact must have an influence on the decision process to develop in the area).

6.7 ANTICIPATED IMPACTS OF THE PROPOSED ACTIVITY

The proposed pipeline installation will transverse several properties which could result in a loss of vegetation, an increase in erosion and silt deposition, a decrease in the functionality of the adjacent wetland and could negatively impair the surface and groundwater quality. Furthermore, the proposed project could result in compaction soils; altering hydromorphic soils; drainage patterns change; altering surface hydrological characteristics; noise and deposition of dust.

A positive impact associated with the proposed activity is that the proposed new pipeline will allow for mine residue removal, land rehabilitation, skills development and poverty alleviation through local employment. Other indirect positive impacts include improvement on biodiversity, water resource quality, air quality, land use etc.

It should be noted that this report has been made available to I&AP's for review and comment and their comments and concerns will be taken into account in the final BAR. Refer to Section 6.6 for the Methodology used in determining and ranking the nature, significance, consequence, extent, duration and probability of potential environmental impacts and risks.

The following section provides a description and assessment of the potential impacts identified in the impact assessment process. Refer to Appendix E for the full impact scoring calculations. A summary of the positive and negative impacts of the proposed activity are provided in Section 6.7 and Table 13.

Table 13: Positive and Negative Impacts of The Proposed Activity

Impact	Positive or Negative	Phase
Loss and fragmentation of vegetation;	Negative	Construction
Erosion;	Negative	Construction
Introduction of alien plant species;	Negative	Construction
Displacement of faunal community;	Negative	Construction
Impact on heritage resources;	Negative	Construction
Impact on palaeontological resources;	Negative	Construction
Compaction;	Negative	Construction
Altering surface hydrology;	Negative	Construction / Operation
Noise;	Negative	Construction
Pollution of soils;	Negative	Construction / Operation
Pollution of surface and ground water;	Negative	Construction / Operation
Air quality (dust);	Negative	Construction
Interference with existing land uses;	Negative	Construction / Operation
Waste management;	Negative	Construction
Limited Job Creation	Positive	Construction / Operation

6.8 THE POSSIBLE MITIGATION MEASURES THAT COULD BE APPLIED AND THE LEVEL OF RISK

The following sections provide a description and assessment of the mitigation measures for each potential impact identified in the impact assessment process. The impact scores below are reflective of the impacts before the implementation of mitigation measures. A second score indicating the final significance of each potential impact is also reflected below. This score indicates the degree of potential loss of irreplaceable resources and

the cumulative nature of the impact. It should be noted that this report will be made available to I&AP's for review and comment and their comments and concerns will be addressed in the final report to be submitted to the DMRE for adjudication. Furthermore, it should be noted that the impact scores themselves will include the results of the aforementioned public response and comment. The results of the public consultation will be used to update the impact scores upon completion of the public review period, where after the finalised report will be submitted to the DMRE for adjudication. Please refer to Appendix E for the full impact scoring calculations. The mitigation hierarchy proposed by Macfarlane et al., (2016) was considered for this study (Figure 10).

Figure 10: Mitigation hierarchy (Research Gate, 2019)

Please refer to Section 8 for the detailed mitigation measures associated with each aspect and impact. The Pre-mitigation significance and final significance for each impact are identified in Table 14 below.

Table 14: Pre- Mitigation Significance and Final Significance

Impact	Positive or Negative	Pre-mitigation Significance	Final Significance
Loss and fragmentation of vegetation	Negative	-12.00	-6.00
Erosion	Negative	-10.00	-3.00
Introduction of alien plant species	Negative	-15.00	-4.50
Displacement of faunal community	Negative	-14.00	-5.06
Impact on heritage resources	Negative	-3.50	-1.50
Impact on palaeontological resources	Negative	-4.50	-2.00
Compaction	Negative	-12.00	-3.75
Altering surface hydrology	Negative	-14.00	-8.25
Noise	Negative	-9.00	-2.50

Impact	Positive or Negative	Pre-mitigation Significance	Final Significance
Pollution of soils	Negative	-12.00	-3.50
Pollution of surface and ground water	Negative	-13.00	-3.50
Air quality (dust)	Negative	-10.00	-2.50
Interference with existing land uses	Negative	-7.50	-1.25
Waste management	Negative	-11.00	-3.00
Limited Job Creation	Positive	+3.00	+6.75

6.9 MOTIVATION WHERE NO ALTERNATIVE SITES WERE CONSIDERED

The primary drivers in determining the location of the proposed pipeline includes location of the TSF, servitude availability, environmental sensitivities and the existing pipeline servitudes. No other alternative to the site will be considered as the FSS6 TSF is already in existence. “No-Go Option” will not be included in the assessment.

Mitigation measures have been recommended as per the sections below and these should be adhered to. Please refer to Section 10.2 below for a map showing the areas of high sensitivity.

6.10 STATEMENT MOTIVATING THE ALTERNATIVE DEVELOPMENT LOCATION

As discussed in section 6.1 above, the proposed application area has been selected due to the location of the existing TSF, Brand A pump station and pipeline servitude. As such no alternative development locations were assessed.

7 ASSESSMENT METHODOLOGY OF IMPACTS

The impact assessment process is broken down as follows:

1. Identification of proposed activities including their nature and duration: Impacts were identified through various methods including a desktop analysis; specialist studies (Heritage and Palaeontological and Wetlands) and the public participation process;
2. Screening of activities likely to result in impacts or risks;
3. Utilisation of the above mentioned EIMS methodology to assess and score preliminary impacts and risks identified. Refer to section 6.6 above for the full methodology used;
4. Inclusion of I&AP comments received through the public participation process regarding impact identification and assessment; and
5. Finalisation of impact identification and scoring.

8 IMPACT ASSESSMENT OF EACH IDENTIFIED POTENTIALLY SIGNIFICANT IMPACT AND RISK

Several potential impacts were identified during the impact assessment process. Table 15 provides a breakdown of the identified potential impacts associated with the activity and provides the associated proposed mitigation measures to minimise the potential impact. Refer to Appendix E for the impact assessment.

Table 15: Potential impacts Identified and associated mitigation measures.

Name of activity	Potential impact	Aspects affected	Phase in which impact is anticipated	Significance if not mitigated	Mitigation type	Significance if mitigated
Servitude clearing / preparation	Interference with existing land uses.	• Site Access.	Construction.	-7.50	• Site access control; • Consultation with landowners with regards to the ensuring that the necessary protective measures for people and vehicles is implemented such as road signs and any infrastructure in the area; and • Consultation with Landowners.	-1.25
	Loss and fragmentation of vegetation	• Clearance and removal of vegetation; • Excavations	Construction.	-12.00	• Limit vegetation clearance to plinths or where absolutely necessary; • Reduce the amount of unnecessary people and restrict vehicle access as much as possible on the property; and • The first 300 mm of soil must be stockpiled separate from the soil excavated deeper than 300 mm.	-6.00

Name of activity	Potential impact	Aspects affected	Phase in which impact is anticipated	Significance if not mitigated	Mitigation type	Significance if mitigated
	Introduction of alien plant species	• Clearance and removal of vegetation.	Construction.	-15.00	• Reduce the amount of unnecessary people and restrict vehicle access as much as possible on the property. • Rehabilitate disturbed areas as soon as possible and control alien plants. • Manage alien plants within close proximity to the site and compile an alien plant management plan.	-4.50
	Displacement of faunal community	• Clearance and removal of vegetation; and • Excavations.	Construction.	-14.00	• Reduce the amount of unnecessary people and restrict vehicle access as much as possible on the property; • The area must be walked though prior to construction to ensure no faunal species remain in the habitat that could potentially get killed. Should animals not move out of the area on their own relevant specialists must be contacted to advise on how the species can be relocated; • Noise must be kept to an absolute minimum during the evenings and at night to	-5.06

Name of activity	Potential impact	Aspects affected	Phase in which impact is anticipated	Significance if not mitigated	Mitigation type	Significance if mitigated
					minimize all possible disturbances to amphibian species and nocturnal mammals; and • No trapping, killing, or poisoning of any wildlife is to be allowed.	
	Impact on heritage resources	• Heritage resources	Construction	-3.50	• Implement chance find procedures in case where possible heritage finds are uncovered.	-1.50
	Impact on palaeontological resources	• Palaeontological resources	Construction	-4.50	• Implement chance find procedures in case where possible palaeontological finds are uncovered.	-2.00
	Pollution of soils	• Exposed and stockpiled soils	Construction / Operation	-12.00	• The contractors used for the construction should have spill kits available prior to construction to ensure that any fuel, oil, or hazardous substance spills are cleaned-up and discarded correctly; • During construction activities, all rubble and waste generated must be removed from the site; and • All contaminated soils must be remediated or removed and	-3.50

Name of activity	Potential impact	Aspects affected	Phase in which impact is anticipated	Significance if not mitigated	Mitigation type	Significance if mitigated
					discarded at an appropriately licensed facility.	
	Pollution of surface and ground water	• Surface and ground water	Construction / Operation	-13.00	• The contractors used for the construction should have spill kits available prior to construction to ensure that any fuel, oil, or hazardous substance spills are cleaned-up and discarded correctly; and • Provision must be made to monitor any unforeseen impact that may arise as a result of the proposed project such as leakages in the pipeline.	-3.50
	Impact on Air quality from dust.	• Clearance of vegetation; and • Stripping and Stockpiling topsoil.	Construction.	-10.00	• The first 300 mm of soil must be stockpiled separate from the soil excavated deeper than 300 mm; • All removed soil and material stockpiles must be protected from erosion, stored on flat areas where run-off will be minimized; • Dust-reducing mitigation measures must be put in place and must be strictly adhered to, for all roads and stockpiles	-2.50

Name of activity	Potential impact	Aspects affected	Phase in which impact is anticipated	Significance if not mitigated	Mitigation type	Significance if mitigated
					especially. This may include wetting of exposed soft soil surfaces, adhering to speed limits and not conducting activities on windy days which will increase the likelihood of dust being generated; • Clearing of construction footprints must be undertaken as close as possible to the commencement of actual construction to prevent the exposure of bare soils for unreasonable periods. • The ambient air quality standard of the National Environmental Management: Air Quality Act must be complied with (GNR 1210 of December 2009), specifically pertaining to particulate matter (PM10). • On completion of the construction all exposed soil must be re-vegetated preferably with indigenous vegetation. • Dust suppression measures such as wetting of exposure soil	

Name of activity	Potential impact	Aspects affected	Phase in which impact is anticipated	Significance if not mitigated	Mitigation type	Significance if mitigated
					must be undertaken frequently.	
	Noise.	• Removal of Vegetation	Construction.	-9.00	• Noise must be kept to an absolute minimum during the evenings and at night to minimize all possible disturbances to amphibian species and nocturnal mammals.	-2.50
	Waste management	• Domestic and industrial waste; • Storage of chemicals, mixes and fuel; • Maintenance of pipelines	Construction /Operational	-11.00	• All construction activities must be restricted to the development footprint area. This includes laydown and storage areas, ablutions, offices etc.; • During construction activities, all rubble and waste generated must be removed from the site; • All contractors and employees should undergo induction which is to include a component of environmental awareness. The induction is to include aspects such as the need to avoid littering, the reporting and cleaning of spills and leaks and general good “housekeeping”;	-3.00

Name of activity	Potential impact	Aspects affected	Phase in which impact is anticipated	Significance if not mitigated	Mitigation type	Significance if mitigated
					• Adequate sanitary facilities and ablutions on the servitude must be provided for all personnel throughout the project area. Use of these facilities must be enforced (these facilities must be kept clean so that they are a desired alternative to the surrounding vegetation); • No dumping of construction material on site may take place; and • All waste generated on site during construction must be adequately managed. Separation and recycling of different waste materials should be supported.	
	Erosion.	• Clearing of vegetation to facilitate the pipeline installation	Construction	-10.00	• All removed soil and material stockpiles must be protected from erosion, stored on flat areas where run-off will be minimised, and be surrounded by bunds; • Any exposed earth should be rehabilitated promptly by planting suitable vegetation (vigorous indigenous grasses) to protect the exposed soil.	-3.00

Name of activity	Potential impact	Aspects affected	Phase in which impact is anticipated	Significance if not mitigated	Mitigation type	Significance if mitigated
	Pollution of soils;	• Ablution facilities;	Construction /Operational	-12.00	• The contractors used for the construction should have spill kits available prior to construction to ensure that any fuel, oil, or hazardous substance spills are cleaned-up and discarded correctly; • Provision must be made to monitor any unforeseen impact that may arise as a result of the proposed project such as leakages in the pipeline; • Implementation of an effective leak detection system for the pipeline. • All chemicals and toxicants to be used for the construction must be stored in a bunded area; • All machinery and equipment should be inspected regularly for faults and possible leaks, these should be serviced off-site.	-3.50
	Pollution of surface and ground water;	• Ablution facilities • Operation of heavy machinery and	Construction /Operational	-13.00	• The contractors used for the construction should have spill kits available prior to construction to ensure that any fuel, oil, or hazardous substance	-3.50

Name of activity	Potential impact	Aspects affected	Phase in which impact is anticipated	Significance if not mitigated	Mitigation type	Significance if mitigated
		equipment in proximity to the watercourses.			spills are cleaned-up and discarded correctly; • Provision must be made to monitor any unforeseen impact that may arise as a result of the proposed project such as leakages in the pipeline; • Implementation of an effective leak detection system for the pipeline; • All chemicals and toxicants to be used for the construction must be stored in a bunded area; • Where chemical toilets are used, they must be secured to the ground to prevent toppling during windy conditions. • All machinery and equipment should be inspected regularly for faults and possible leaks, these should be serviced off-site.	
	Compaction.	• Stripping and stockpiling topsoil; • Vehicle and machinery	Construction /Operational	-12.00	• All construction activities must be restricted to the development footprint area. This includes laydown and storage areas, ablutions, offices etc.;	-3.75

Name of activity	Potential impact	Aspects affected	Phase in which impact is anticipated	Significance if not mitigated	Mitigation type	Significance if mitigated
		access to servitude			• Construction vehicles and machinery must make use of existing access routes; • Where possible, compacted areas must be ripped and revegetated at the end of the construction phase.	
	Altering surface hydrology	• Excavations; • Clearing of vegetation to facilitate the pipeline installation.	Construction /Operational	-14.00	• Construction vehicles and machinery must make use of existing access routes; • The topography of the project area must be returned to as close to preconstruction conditions as possible.	-8.25
Installation of Pipeline.	Loss and fragmentation of vegetation	• Vehicle and machinery access to servitude	Construction.	-12.00	• Site access control, limit vehicle access to only essential machinery where possible; • Consultation with Landowners.	-6.00
	Erosion	• Bare or exposed areas	Construction	-10.00	• All removed soil and material stockpiles must be protected from erosion, stored on flat areas where run-off will be minimised; and • Any exposed earth should be rehabilitated promptly by planting suitable vegetation	-3.00

Name of activity	Potential impact	Aspects affected	Phase in which impact is anticipated	Significance if not mitigated	Mitigation type	Significance if mitigated
					(vigorous indigenous grasses) to protect the exposed soil.	
	Introduction of alien plant species;	• Bare or exposed areas	Construction and Operation	-15.00	• Reduce the amount of unnecessary people and restrict vehicle access as much as possible on the property. • Rehabilitate disturbed areas as soon as possible and control alien plants. • Manage alien plants within close proximity to the site and compile an alien plant management plan.	-4.50
	Impact on Air quality from dust.	• Bare or exposed areas	Construction	-10.00	• Dust-reducing mitigation measures must be put in place and must be strictly adhered to, for all roads and dumps especially. This includes wetting of exposed soft soil surfaces and not conducting activities on windy days which will increase the likelihood of dust being generated. • Clearing of construction footprints must be undertaken as close as possible to the commencement of actual construction to prevent the	-2.50

Name of activity	Potential impact	Aspects affected	Phase in which impact is anticipated	Significance if not mitigated	Mitigation type	Significance if mitigated
					exposure of bare soils for unreasonable periods. • The ambient air quality standard of the National Environmental Management: Air Quality Act must be complied with (GNR 1210 of December 2009), specifically pertaining to particulate matter (PM10). • On completion of the construction all exposed soil must be re-vegetated preferably with indigenous vegetation. • Dust suppression measures such as wetting of exposure soil must be undertaken frequently.	
	Waste management	• Directly affected and adjacent properties	Construction	-11.00	• Waste management must be a priority and all waste must be collected and stored effectively; • Adequate sanitary facilities and ablutions on the servitude must be provided for all personnel throughout the project area. Use of these facilities must be enforced	-3.00

Name of activity	Potential impact	Aspects affected	Phase in which impact is anticipated	Significance if not mitigated	Mitigation type	Significance if mitigated
					(these facilities must be kept clean so that they are a desired alternative to the surrounding vegetation); • No dumping on construction material on site may take place; • All waste generated on site during construction must be adequately managed. Separation and recycling of different waste materials should be supported; • A minimum of one toilet must be provided per 10 persons. Portable toilets must be pumped dry to ensure the system does not degrade over time and spill into the surrounding area; • The Contractor should supply sealable and properly marked domestic waste collection bins and all solid waste collected shall be disposed of at a licensed disposal facility; • Where a registered disposal facility is not available close to the project area, the	

Name of activity	Potential impact	Aspects affected	Phase in which impact is anticipated	Significance if not mitigated	Mitigation type	Significance if mitigated
					Contractor shall provide a method statement with regards to waste management; • Under no circumstances may domestic waste be burned on site; • Refuse bins will be emptied and secured. Temporary storage of domestic waste shall be in covered waste skips; and • Maximum domestic waste storage period will be 10 days.	
	Noise.	• Installation of Pipeline.	Construction.	-9.00	• Noise must be kept to an absolute minimum during the evenings and at night to minimize all possible disturbances to amphibian species and nocturnal mammals.	-2.50
	Interference with existing land uses.	• Property access	Construction.	-7.50	• Consultation with Landowners; and • Reduce the amount of unnecessary people and restrict vehicle access as much as possible on the property.	-1.25

Name of activity	Potential impact	Aspects affected	Phase in which impact is anticipated	Significance if not mitigated	Mitigation type	Significance if mitigated
					• Strict access control.	
	Compaction	• Stripping and stockpiling topsoil • Operation of heavy machinery and equipment in proximity to the watercourses; • Ablution facilities; • Domestic and industrial waste; • Storage and management of chemicals, mixes and fuel; • Maintenance of pipelines.	Construction / Operation	-12.00	• The contractors used for the construction should have spill kits available prior to construction to ensure that any fuel, oil, or hazardous substance spills are cleaned-up and discarded correctly; • All construction activities must be restricted to the development footprint area. This includes laydown and storage areas, ablutions, offices etc.; • Provision must be made to monitor any unforeseen impact that may arise as a result of the proposed project such as leakages in the pipeline; • Implementation of an effective leak detection system for the pipeline; • During construction activities, all rubble and waste generated must be removed from the site;	-3.75
	Altering surface hydrology		Construction / Operation	-14.00		-8.25
	Pollution of soils		Construction / Operation	-12.00		-3.50
	Pollution of surface and ground water		Construction / Operation	-13.00		-3.50

Name of activity	Potential impact	Aspects affected	Phase in which impact is anticipated	Significance if not mitigated	Mitigation type	Significance if mitigated
					• Construction vehicles and machinery must make use of existing access routes; • All chemicals and toxicants to be used for the construction must be stored in a bunded area; • All machinery and equipment should be inspected regularly for faults and possible leaks, these should be serviced off-site; • All contractors and employees should undergo induction which is to include a component of environmental awareness. The induction is to include aspects such as the need to avoid littering, the reporting and cleaning of spills and leaks and general good "housekeeping"; • Adequate sanitary facilities and ablutions on the servitude must be provided for all personnel throughout the project area. Use of these facilities must be enforced (these facilities must be kept clean so that they are a desired alternative to the surrounding vegetation);	

Name of activity	Potential impact	Aspects affected	Phase in which impact is anticipated	Significance if not mitigated	Mitigation type	Significance if mitigated
					• All removed soil and material stockpiles must be protected from erosion, stored on flat areas where run-off will be minimised; • Any exposed earth should be rehabilitated promptly by planting suitable vegetation (vigorous indigenous grasses) to protect the exposed soil; • No dumping of construction material on site may take place; and • All waste generated on site during construction must be adequately managed. Separation and recycling of different waste materials should be supported.	

9 SUMMARY OF SPECIALIST REPORTS

Various specialists that were appointed to undertake the specialist assessments for the application area. Table 16 presents a summary of the findings and recommendations as identified in the specialist studies undertaken to inform the BAR.

The following specialist studies were undertaken:

- Wetland Assessment and Hydropedology Statement – The Biodiversity Company; and
- Heritage and Palaeontological Impact Assessment – PGS Heritage.

Table 16: Summary of Specialist Findings

Specialist study undertaken	Recommendations of Specialist Report	Specialist Recommendations that have been included in the BA Report (Mark with X where applicable	Reference to the applicable section of the Report where Specialist recommendations have been included.
Heritage and Palaeontological Impact Assessment	The HIA has shown that despite an intensive walkthrough of the footprint area, no evidence for any archaeological or heritage sites could be identified. As a result, no impact is expected from the proposed development on heritage. It is possible that cultural material will be exposed during construction and may be recoverable. As such, it is recommended that the following chance find procedure should be implemented. • An appropriately qualified heritage practitioner/archaeologist must be identified to be called upon in the event that any possible heritage resources or artefacts are identified. • Should an archaeological site or cultural material be discovered during construction (or operation), the area should be demarcated, and construction activities halted. • The qualified heritage practitioner/archaeologist will then need to come out to the site and evaluate the Heritage resources and make the necessary recommendations for mitigating the find and the impact on the heritage resource. • The contractor therefore should have some sort of contingency plan so that operations could move elsewhere temporarily while the materials and data are recovered. • Construction can commence as soon as the site has been cleared and signed off by the heritage practitioner/archaeologist.	X	Sections 8

Specialist study undertaken	Recommendations of Specialist Report	Specialist Recommendations that have been included in the BA Report (Mark with X where applicable	Reference to the applicable section of the Report where Specialist recommendations have been included.
Wetland Assessment and Hydropedology Statement	One wetland HGM type was identified within the 500 m regulated area, namely a depression. Additionally, various artificial wetlands and canals were identified, which has been disregarded from this assessment. The depression has been determined to have an intermediate average ecosystem service score, a moderate importance and sensitivity and is characterised by a "Seriously Modified" state. A 15 m buffer has been recommended to ensure the conservation of this wetland type, even though the proposed pipeline is located approximately 300 m from the delineated wetland. Considering the distance between the proposed pipeline as well as the fact that the area between the proposed pipeline and the relevant wetland are characterised by the Ermelo soil form with deep, freely drained yellow-brown apedal horizons (which limits overland flow), no indirect risks are foreseen. Since no risks are expected towards natural wetland systems, it was recommended by the specialist that the proposed activities may proceed without the application for a water use authorisation. After consultation with the DWS, the authority indicated that a water use licence application was required. The process of applying for a water use licence is therefore underway.	X	Sections 8

10 ENVIRONMENTAL IMPACT STATEMENT

10.1 SUMMARY OF KEY FINDINGS

A summary of the key findings of the environmental impact assessment as undertaken in this BAR is outlined below:

- Majority of the impacts had a medium rating prior to mitigations, which were then decreased to low-negative once mitigations are implemented.
- The proposed installation of the pipeline has the potential to impact negatively on the surrounding environment and properties it will transverse. However, impact assessments conducted by the EAP and specialists concluded that the foreseeable impacts can be mitigated through the implementation of the proposed mitigation measures.
- The HIA did not identify any heritage resources within the study area, however, heritage chance finds are possible during clearing and excavation. Impacts can be mitigated through the implementation of the proposed mitigation measures (Chance find procedure).
- The Wetland assessment concluded that considering the distance between the proposed pipeline as well as the fact that the area between the proposed pipeline and the relevant depression is characterised by the Ermelo soil form with deep, freely drained yellow-brown apedal horizons (which limits overland flow), no indirect risks are foreseen. This explanation is also emphasised by the hydropedological component which suggests that no impacts are foreseen and that a zero percent loss of moisture to the depression is expected.

Key findings for the socio-economic environment

- The proposed installation of the pipeline activity has the potential to affect the current land use and disrupt services if not properly managed or mitigated.
- Consultation with the community and landowners will be conducted in order to capture any comments or concerns regarding the proposed activities and to ensure the community and landowners are kept informed and allowed to raise issues. The concerns raised will be included in the final BAR.

10.2 FINAL SITE MAP

The wetland delineation map showing the location of the sensitive areas is shown in Figure 11 below. The proposed reclamation pipeline is largely located in degraded areas with a single identified sensitivity being the delineated wetland (Depression) approximately 300 m south of the Brand A pump station. Considerable artificial inputs from various sources have led to the formation of wetlands, these systems are all deemed to be artificial. The full extent of artificial wetlands is difficult to determine due to the anthropogenic nature of these systems. Therefore, only natural wetlands were focussed on with not all artificial systems delineated.

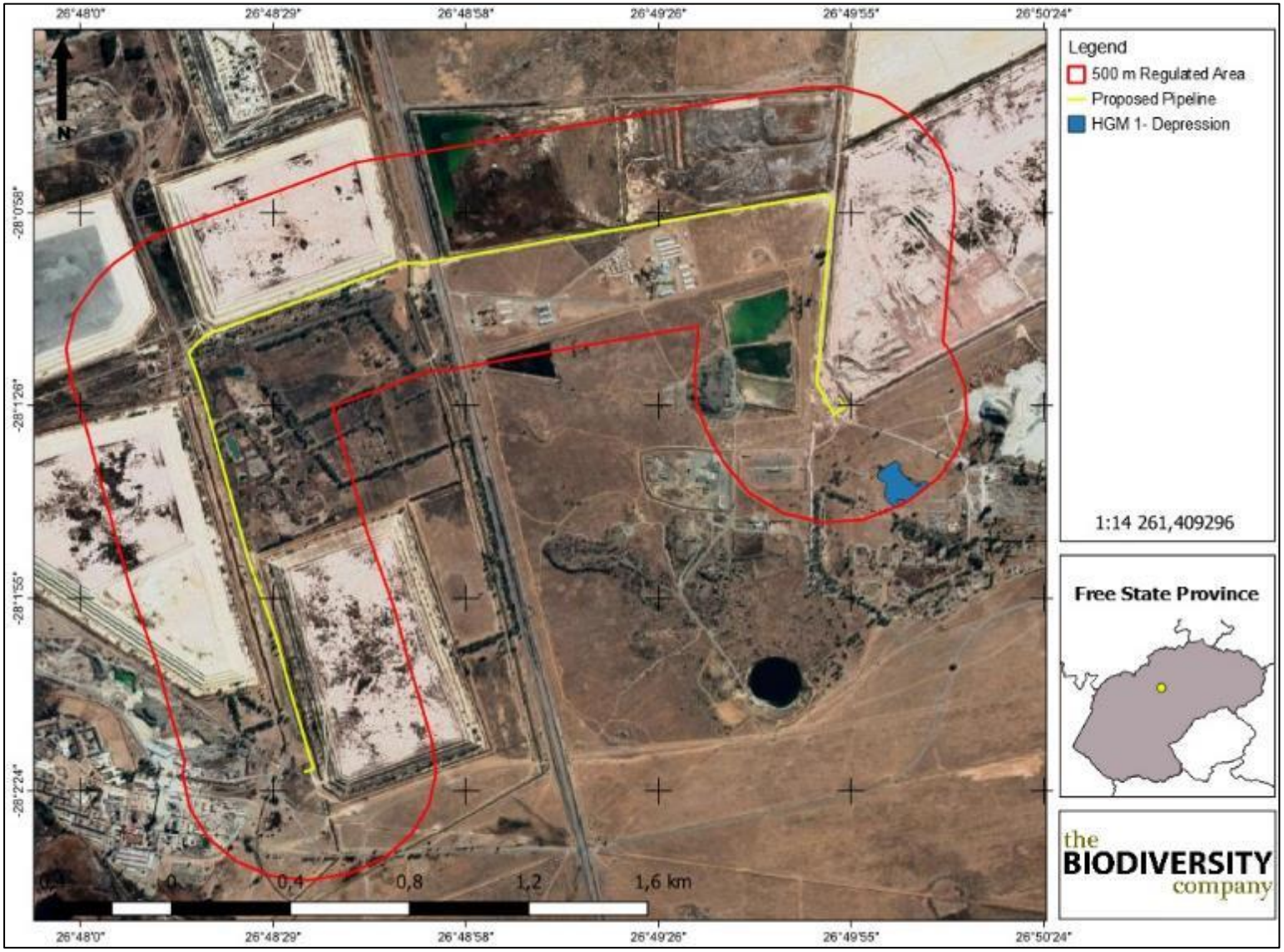

Figure 11: Delineation of natural wetlands within 500 m of the project area.

10.3 SUMMARY OF POSITIVE AND NEGATIVE IMPLICATIONS AND RISKS

The proposed pipeline installation will transverse serval properties which could result in direct and indirect environmental impacts. Furthermore, the proposed project could also result in erosion; compaction; introduction of alien species; altering surface hydrology; soil, surface and groundwater pollution; noise; dust; waste management challenges among others.

A positive impact of the proposed activity includes impacts such as mine residue removals, land rehabilitation, skills development and poverty alleviation through employment opportunities. Other indirect positive impacts include improvement on biodiversity, water resource quality, air quality, land use etc.

The implementation of the proposed mitigation measure will ensure that the negative implications and risks of the project are reduced to a low level. Appropriate mechanisms for avoidance and mitigation of these negative impacts are included in the EMPr.

The potential negative impacts are as follows:

- Loss and fragmentation of vegetation;
- Erosion;
- Introduction of alien plant species;
- Displacement of faunal community;
- Impact on heritage resources;
- Impact on palaeontological resources;
- Compaction;
- Altering surface hydrology;
- Noise;
- Pollution of soils;
- Pollution of surface and ground water;
- Air quality (dust);
- Interference with existing land uses;
- Waste management.

11 PROPOSED IMPACT MANAGEMENT OBJECTIVES AND OUTCOMES

The management objective is to minimise the socio-economic, cultural, heritage, biodiversity, and palaeontological impacts of the proposed activity in terms of the perceptions and expectations of I&AP's. The outcome to be achieved is to lessen the impact through the following measures:

- Adhere to an open and transparent communication procedure with stakeholders at all times;
- Ensure that accurate information regarding the installation of pipeline to be undertaken and the resultant lack of requirements for site access and labour is communicated to I&APs;
- Ensure that information is communicated in a manner which is understandable and accessible to I&APs;
- Prevent the unnecessary destruction of, and fragmentation, of the vegetation community;

- Prevent the loss of the faunal community (including potentially occurring species of conservation concern) associated with these vegetation communities;
- Limiting the activity to the defined servitude area and only impacting those areas where it is unavoidable to do so otherwise;
- Enhance project benefits and minimise negative impacts through consultation with stakeholders;
- To limit interference with existing land uses as far as possible during installation of the pipeline;
- To avoid damage to road infrastructure;
- To mitigate the impact on the wetlands;
- To prevent water quality impairment;
- To mitigate the impact on hydromorphic soils and compaction; and
- To maintain safety to communities.

12 ASPECTS FOR INCLUSION AS CONDITIONS OF AUTHORISATION

The following conditions are recommended for inclusion in the Environmental Authorisation:

- All mitigation measures included in the Basic Assessment Report, EMPr and associated specialist studies report must be adhered to;
- Landowners and occupiers should be consulted prior to and during the construction and installation of the pipeline; and
- An Environmental Control Officer should be appointed for the proposed installation of the pipeline project to monitor compliance with the conditions of the Authorisation and EMPr.

13 DESCRIPTION OF ANY ASSUMPTIONS, UNCERTAINTIES AND GAPS IN KNOWLEDGE

Certain assumptions, limitations, and uncertainties are associated with the BAR. This report is based on information that is currently available and, as a result, the following limitations and assumptions are applicable:

- The project scope and descriptions are based on project information provided by the client;
- The information presented in this report is based on the information available at the time of compilation of the report;
- It is assumed that all data and information supplied by the Specialist, Applicant or any of their staff or consultants is complete, valid, and true; and
- The description of the baseline environment has been obtained from specialist studies.

Furthermore, certain assumptions, limitations, and uncertainties are associated with the BAR specialist studies and these are detailed for each aspect below.

- Wetland Impact Assessment:
    - Only wetlands that were likely to be impacted by proposed development activities were assessed in the field. Wetlands located within a 500 m radius of the sites but not in a position within the landscape to be measurably affected by the developments were not considered as part of this assessment;

- A portion south of the pipeline was inaccessible during the site survey due to the fact that this area is fenced off as private property (Willow Valley Poultry Farm). This area could therefore only be assessed by means of desktop and visual assessments;
- Considerable artificial inputs from various sources have led to the formation of wetlands, these systems are all deemed to be artificial. The full extent of artificial wetlands is difficult to determine due to the anthropogenic nature of these systems. Therefore, only natural wetlands were focussed on with not all artificial systems delineated; and
- The GPS used for water resource delineations is accurate to within five meters. Therefore, the wetland delineation plotted digitally may be offset by at least five meters to either side.

- Heritage and Palaeontological
  - Not detracting in any way from the comprehensiveness of the research undertaken, it is necessary to realise that the heritage resources located during the desktop research and fieldwork do not necessarily represent all the possible heritage resources present within the area.
  - Such observed or located heritage features and/or objects may not be disturbed or removed in any way until such time that the heritage specialist has been able to make an assessment as to the significance of the site (or material) in question. This applies to graves and cemeteries as well.

14 REASONED OPINION AS TO WHETHER THE PROPOSED ACTIVITY SHOULD OR SHOULD NOT BE AUTHORISED

14.1 REASONS WHY THE ACTIVITY SHOULD BE AUTHORISED OR NOT

The impacts on the environment can be mitigated through open communication with the community, landowners, and implementation of the proposed EMPr mitigation measures. It is therefore the opinion of the EAP that the proposed activity should be authorised.

14.2 CONDITIONS THAT MUST BE INCLUDED IN THE AUTHORISATION

The following conditions should be included in the environmental authorisation:

- Stakeholder Engagement will continue throughout the construction and installation of the pipeline to ensure the community and landowners are kept informed and allowed to raise issues. These issues will then be addressed through a grievance mechanism.
- The applicant should adhere to the conditions of the EA, EMPr and the Specialist reports for this project.
- The financial provisions for the affected Mining Right areas must be updated during the annual review to include financial provisions for the pipeline.
- An independent Environmental Control Officer should be appointed for the proposed pipeline project to ensure compliance with the EMPr.

15 PERIOD FOR WHICH THE ENVIRONMENTAL AUTHORISATION IS REQUIRED

The Environmental Authorisation is required for a minimum of ten (10) years.

16 UNDERTAKING

It is confirmed that the undertaking required to meet the requirements of this section is provided at the end of the EMPr and is applicable to both the BAR and the EMPr. Refer to 26 for the signed undertakings.

17 FINANCIAL PROVISION

No financial provisions were required for this project. The application for environmental authorisation is for the proposed installation of a reclamation pipeline and as such no financial provisions are required. It is however recommended that the financial provisions for the affected Mining Rights be updated during the annual review to include the pipeline.

17.1 EXPLAIN HOW THE AFORESAID AMOUNT WAS DERIVED

No financial provisions were required for this project. The application for environmental authorisation is for the proposed installation of a reclamation pipeline and as such no financial provisions are required.

17.2 CONFIRM THAT THIS AMOUNT CAN BE PROVIDED FOR FROM OPERATING EXPENDITURE

No financial provisions were required for this project. The application for environmental authorisation is for the proposed installation of a reclamation pipeline and as such no financial provisions are required.

17.3 SPECIFIC INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

No specific information has been requested by the Competent Authority at this stage. This section may be updated at a later stage should additional information be required from the competent authority.

17.4 COMPLIANCE SECTIONS 24(4)(A) AND (B) READ WITH SECTION 24(3)(A) AND (7) OF THE NEMA

17.4.1.1 IMPACT ON THE SOCIO-ECONOMIC CONDITIONS OF ANY DIRECTLY AFFECTED PERSON

The potential impacts on the socio-economic conditions have the potential to include:

- Job creation:

  The proposed pipeline project is anticipated to be the primary reclamation / slurry transfer pipeline ensuring the continuation of reclamation of the FSS6 TSF operations. The continuation of the reclamation operations will allow for the existing mine employees to continue earning a livelihood. In addition to the continuation of the reclamation operations, the proposed pipeline will result in temporary employment opportunities for the installation of the pipeline.

- Safety and security risks to landowners and lawful occupiers:

  The impact on safety and security will be minimal as people on site will be limited to the Applicant and associated contractors. The construction will need to comply with the relevant obligations of the Occupational Health and Safety Act, the Construction Regulations, and the Mine Health and Safety Act.

- Potential interference with existing land uses:

  Access to the project area for the construction and installation of the pipeline may interrupt the existing land uses, such as the R730 usage. However, this impact is limited as equipment brought on site will be for a short duration and all necessary arrangements with the landowners will be made to minimise any potential interference with their operations. Furthermore, ongoing consultation with landowners necessary to ensure that the necessary protective measures for livestock and people are implemented and maintained for the duration of the project.

- Noise Impacts:

  The proposed project has the potential to create a noise nuisance as a result of heavy machinery for the removal of vegetation and installation of the pipeline. A grievance mechanism must be developed, and details provided to all affected landowners. Site activities shall operate during daytime working hours (8:00am to 5:00pm) to avoid noise disturbances at night.

- The consultation process will allow directly affected parties to raise their concerns. Further to this, it must be noted that I&AP's, including directly affected parties such as landowners, have the opportunity to review and comment on this report. The results of the public consultation will be included in the final report submitted to the department for adjudication.

17.4.1.2 IMPACT ON ANY NATIONAL ESTATE REFERRED TO IN SECTION 3(2) OF THE NATIONAL HERITAGE RESOURCES ACT

Heritage and Palaeontological Specialist studies were undertaken for the proposed project. No evidence for any archaeological or heritage sites could be identified. As a result, no impact is expected from the proposed development on heritage. Notice of the proposed EA Application and associated documents will be uploaded onto the South African Heritage Resources Agency's (SAHRA) website, South African Heritage Information System (SAHRIS) for review and comment.

18 OTHER MATTERS REQUIRED IN TERMS OF SECTIONS 24(4)(A) AND (B) OF THE ACT

Section 24(4) (A) and (B) refer to the "procedures for investigation, assessment and communication of the potential consequences or impacts of activities on the environment". The table below provides reference to where in the report section 24 (4) (A) and (B) is addressed.

Sub-Section Reference	Applicable legislation under section 24 (4)(A) and (B) of the NEMA	Reference Where Applied (i.e., where in this document has it been explained how the development complies section 24 (4)
24 (a) must ensure, with respect to every application for an environmental authorisation-		
24 (a) (i)	coordination and cooperation between organs of state in the consideration of assessments where an activity falls under the jurisdiction of more than one organ of state	Refer to Section 6.2 and Appendix B Both the Matjhabeng Local Municipality and Lejweleputswa District Municipality were included on the I&AP database, notified, and provided with an opportunity to review and comment on the BAR and associated appendices.
24 (a) (ii)	that the findings and recommendations flowing from an investigation, the general objectives of integrated environmental management laid down in this Act and the principles of environmental management set out in section 2 are taken into account in any decision made by an organ of state in relation to any proposed policy, programme, process, plan, or project	Refer to Section 9 and Section 10 A summary of the specialist reports, including the recommendations is presented in Section 9. Section 10 presents a summary of the key findings.

Sub-Section Reference	Applicable legislation under section 24 (4)(A) and (B) of the NEMA	Reference Where Applied (i.e., where in this document has it been explained how the development complies section 24 (4)
24 (a) (iii)	that a description of the environment likely to be significantly affected by the proposed activity is contained in such application	Refer to Section 6.4. Section 6.4 provides a summary of the environmental attributes for the proposed project area.
24 (a) (iv)	investigation of the potential consequences for or impacts on the environment of the activity and assessment of the significance of those potential consequences or impacts	Refer to sections 6.5, 6.6, 6.7, 6.8 and 8. Sections 6.5, 6.6, 6.7 6.8 and 8 identifies potential impacts and risks, outlines the impact assessment methodology applied and presents the potential positive and negative impacts associated with the project, respectively. Section 8 presents the impact assessment for the identified impacts.
24 (a) (v)	public information and participation procedures which provide all interested and affected parties, including all organs of state in all spheres of government that may have jurisdiction over any aspect of the activity, with a reasonable opportunity to participate in those information and participation procedures	Refer to Section 6.2 and Appendix B Section 6.2 provides a summary of the public participation process to be followed. The Public Participation Report and associated appendices is attached in Appendix B.
24 (b) must include, with respect to every application for an environmental authorisation and where applicable—		
24 (b) (i)	investigation 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	Refer to Section 6.9 and 6.10. Section 6.9 and 6.10 motivation as to why no alternative sites were considered and motivation for alternative site development, respectively.
24 (b) (ii)	investigation of mitigation measures to keep adverse consequences or impacts to a minimum	Refer to Section 6.8. and Appendix D Section 6.8.provides possible mitigation measures for the potential impacts for each activity. Specialist Assessments are included in Appendix D.
24 (b) (iii)	investigation, assessment, and evaluation of the impact of any proposed listed or specified activity on any national estate referred to in section 3(2) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999), excluding the national estate	Refer to Appendix D and Section 8. Impacts in terms of the National Heritage Resources Act, 1999 are assessed in Section 8. The HIA is included in Appendix D.

Sub-Section Reference	Applicable legislation under section 24 (4)(A) and (B) of the NEMA	Reference Where Applied (i.e., where in this document has it been explained how the development complies section 24 (4)
	contemplated in section 3(2)(i)(vi) and (vii) of that Act	
24 (b) (iv)	reporting on gaps in knowledge, the adequacy of predictive methods and underlying assumptions, and uncertainties encountered in compiling the required information	Refer to Section 13. Assumptions, Uncertainties and Gaps in Knowledge are included in Section 13.
24 (b) (v)	Investigation and formulation of arrangements for the monitoring and management of consequences for or impacts on the environment, and the assessment of the effectiveness of such arrangements after their implementation	Refer to Sections 20.4 and 20.5 of the Environmental Management Programme for proposed mitigation measures and Section 22 for details regarding monitoring compliance.
24 (b) (vi)	consideration of environmental attributes identified in the compilation of information and maps contemplated in subsection (3);	Refer to Section 6.4 environmental attributes and Appendix C for maps.
24 (b) (vii)	provision for the adherence to requirements that are prescribed in a specific environmental management Act relevant to the listed or specified activity in question	Refer to Section 3 for the policy and legislative context.

In terms of Section 24(4)(b)(i) of the NEMA, the Environmental Impact Assessment Regulations (2014, as amended), requires the application to identify alternatives for the proposed project in terms of:

- Location of the development;
- The type of activity to be undertaken;
- Design or layout of the development;
- The technology to be used;
- The operational aspects of the activity; and
- The option of not implementing the activity.

The applicant plans to construct a new reclamation pump station at FSS 6 TSF and slurry transfer pipeline from FSS6 TSF to Brand A Pump Station to transport reclaimed slurry. Once at Brand A, the slurry will be pumped into a sump and transported to the Saaiplaas Plant via an existing pipeline. The proposed slurry pipeline (From FSS6 TSF to Brand A Pump Station) is approximately 5.9km in length and will be constructed above ground, within existing servitudes.

The following alternative assessment was conducted:

Location of development: The primary drivers in determining the location of the proposed pipeline includes location of the TSF, servitude availability, environmental sensitivities and the existing pipeline servitudes. The proposed alignment is highly modified, as such no further assessment of alternative properties were

undertaken. It is not anticipated that the proposed pipeline will affect the continuation of the long term land uses.

Type of activity: The proposed project involves the installation of a slurry reclamation pipeline between FSS6 TSF and the existing Brand A pump station. Due to the nature and benefits of the proposed activity, no assessment of alternative activities was assessed.

Design or Layout: The current layout plan for the Proposed Project is considered as the preferred layout plan. The layout plan is dictated by the existing location of the TSF, the Brand A pump station and its associated infrastructure. Therefore, no other layout alternative was considered further.

Technology: The proposed project involves the installation of a reclamation pipeline, a 450mm wide steel (SABS 719 Grade B, with 10mm Cement Mortar Lining (CML)) pipe is to be to be installed above ground flanged on plinths. No alternative technologies were considered in this assessment as the proposed technology is considered the standard practice for a slurry / reclamation pipeline in the area.

Operational Aspects: The planned activity is the conveyance of reclaimed slurry from the FSS6 TSF to the Brand A pump station. Therefore, no alternative operational aspects were considered in this assessment.

"No-go" Option: The no go alternative would imply that the no new slurry transfer pipeline will be installed and the status quo remains. The option of the project not proceeding would mean that the environmental impact and social status would remain the same as current.

PART B: ENVIRONMENTAL MANAGEMENT PROGRAMME

19 EMPR INTRODUCTION

19.1 DETAILS OF THE EAP

The details and expertise of the EAP are detailed in Section 1 above as required.

19.2 DESCRIPTION OF THE ASPECTS OF THE ACTIVITY

A description of the aspects of the activity covered by the EMPr below is included in Section 2 above.

19.3 COMPOSITE MAP

Please refer to Section 10.2 above and Appendix C.

20 DESCRIPTION OF IMPACT MANAGEMENT OBJECTIVES INCLUDING MANAGEMENT STATEMENTS

20.1 DETERMINATION OF CLOSURE OBJECTIVES

The proposed project is for EA for the installation of a reclamation pipeline and therefore no closure objectives have been identified as yet. The Applicant has an obligation to determine applicable closure objectives, plan for rehabilitation and closure, and provide adequate financial provisions. The mine must ensure that their Financial Provisions Reports are updated annually and must when relevant include provision for the decommissioning and rehabilitation of this pipeline.

20.2 VOLUMES AND RATE OF WATER USE REQUIRED FOR THE OPERATION

Water for domestic use will be available for the construction workers at the mine. No additional water is anticipated to be required for the construction of the proposed reclamation pipeline project.

20.3 HAS A WATER USE LICENCE BEEN APPLIED FOR?

A water use license application process has been applied for.

20.4 IMPACTS TO BE MITIGATED IN THEIR RESPECTIVE PHASES

Several activities will be undertaken for the proposed installation of the pipeline should it be authorised. Table 17 provides a breakdown of the identified potential impacts associated with the activity and provides the associated proposed mitigation measures to minimise the potential impact. Refer to Appendix E for the impact assessment. Table 17 outlines mitigation measures to be undertaken to minimise the impacts of the proposed project.

Table 17: Impacts to Be Mitigated

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
Clearance of Vegetation	Construction	Short term and localized to plinths	• Demarcation of sensitive areas in consultation with relevant specialists and ECO; • The contractors used for the construction should have spill kits available prior to construction to ensure that any fuel, oil or hazardous substance spills are cleaned-up and discarded correctly; • All construction activities must be restricted to the development footprint area. This includes laydown and storage areas, ablutions, offices etc.; • During construction activities, all rubble generated must be removed from the site; • Construction vehicles and machinery must make use of existing access routes; • All chemicals and toxicants to be used for the construction must be stored in a bunded area; • All machinery and equipment should be inspected regularly for faults and possible leaks, these should be serviced off-site;	NEMA MPRDA NEMBA NEMAQA Dust regulations NWA DWAF Best Practice Guidelines	Throughout the project lifespan

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
			• All removed soil and material stockpiles must be protected from erosion, stored on flat areas where run-off will be minimised; • Any exposed earth should be rehabilitated promptly by planting suitable vegetation (vigorous indigenous grasses) to protect the exposed soil; • Utilise local labour if possible; • Minimise removal of vegetation as far as possible; • Identification and relocation of protected species by a qualified ecologist (and application or the relevant biodiversity permits where required); • When vegetation is cleared, hand cutting techniques should be used as far possible in order to avoid the use of heavy machinery; • Minimize dust generation; • It should be made an offence for any staff to take/bring any plant species into/out of any portion of the project area. No plant species whether indigenous or exotic should be brought into/taken from the project area, to prevent the spread of exotic or invasive species or the illegal collection of plants; • Limit vehicle access;		

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
			• Implement alien species vegetation management plan; • Emergency preparedness; • A qualified environmental control officer must be on site when installation of the pipeline begins to identify SCC that will be directly disturbed and to relocate fauna/flora that are found; • The area must be walked though prior to installation of the pipeline to ensure no faunal species remain in the habitat and get killed. Should animals not move out of the area on their own relevant specialists must be contacted to advise on how the species can be relocate; • Avoid disturbance of fauna as much as possible, especially bird nesting sites (if any); • The first 300 mm of soil (i.e. topsoil) must be stockpiled separate from the soil excavated deeper than 300 mm; • No heavy machinery must be allowed within the delineated wetland. • All vehicles (small trucks and other vehicles) required for the proposed activities should only be allowed to use existing roads (including dirt roads);		

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
			• All structure footprints to be rehabilitated and landscaped after the development is complete. Rehabilitation of the disturbed areas existing in the project area must be made a priority. Topsoil must also be utilised, and any disturbed area must be re-vegetated with plant and grass species which are endemic to the area; • Progressive rehabilitation as the construction of the pipeline continues as well as any cleared areas will enable topsoil to be returned more rapidly, thus ensuring more recruitment from the existing seedbank; • A rehabilitation plan must be developed and implemented; • A hydrocarbon spill management plan must be put in place to ensure that should there be any chemical spill out or over that it does not run into the surrounding areas. The Contractor shall be in possession of an emergency spill kit that must always be complete and available on site. Drip trays or any form of oil absorbent material must be in place to be used underneath parked vehicles/machinery and equipment in case of leaks. No servicing of equipment on site unless necessary. All contaminated soil should be treated in situ or removed and be placed in containers;		

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
			• Leaking equipment and vehicles must be repaired immediately or be removed from project area to facilitate repair; • Protected plant species need either a permit to be destroyed or can be relocated within the area by a qualified person.		
Site access	Construction / operation	Short term and localized	• All employees and visitors to the site must undergo a site induction which shall include basic environmental awareness and site-specific environmental requirements (e.g. site sensitivities and relevant protocols/procedures). This induction should be presented or otherwise facilitated by the Contractors EO/Mine EO wherever possible; • Landowners/lawful occupiers must be notified prior to accessing properties. A date and time that is suitable to landowners/lawful occupiers and is reasonable to the applicant should be negotiated and agreed upon; • The number, identity of workers, work location and work to be done must be provided to the landowner/lawful occupier prior to going on site; • Consideration must be taken by the applicant and/or contractors when on site not to interfere with the existing land uses and practices; • All construction activities must be restricted to the development footprint area. This includes	NEMA OHS and MHSA	Throughout the project lifespan

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
			laydown and storage areas, ablutions, offices etc. The contractors used for the construction should have spill kits available prior to construction to ensure that any fuel, oil, or hazardous substance spills are cleaned-up and discarded correctly; • No heavy machinery must be allowed within the delineated wetland; and • All vehicles (small trucks and other vehicles) required for the proposed activities should only be allowed to use existing roads (including dirt roads).		
Waste management	Construction/ operation	Short term and localized	• Waste generated on site must be recycled as far as possible. Recyclable waste must not be stored on site for excessive periods to reduce risk of environmental contamination; • Waste management must be a priority and all waste must be collected and stored adequately; • It is recommended that all waste be removed from site on a weekly basis; to prevent rodents and pests entering the site; • The Contractor should supply sealable and properly marked domestic waste collection bins and all solid waste collected shall be disposed of at a licensed disposal facility; • Where a registered disposal facility is not available close to the project area, the	DWAF Minimum requirements for waste disposal NEMWA	Throughout the project lifespan

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
			Contractor shall provide a method statement with regard to waste management; • Under no circumstances may domestic waste be burned on site; • All contractors and employees should undergo induction which is to include a component of environmental awareness. The induction is to include aspects such as the need to avoid littering, the reporting and cleaning of spills and leaks and general good "housekeeping"; • Adequate sanitary facilities and ablutions on the servitude must be provided for all personnel throughout the project area. Use of these facilities must be enforced (these facilities must be kept clean so that they are a desired alternative to the surrounding vegetation); • No dumping of construction material on site may take place; • Refuse bins will be emptied and secured; • Temporary storage of domestic waste shall be in covered waste bins / skips; • Maximum domestic waste storage period will be 10 days; • A Waste Management System must be implemented and provide for adequate waste storage (in the form of enclosed containers)		

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
			waste separation for recycling, and frequent removal of non-recyclable waste for permanent disposal at an appropriately licensed waste disposal facility; and • No waste material is to be disposed of on site.		
Installation of pipeline	Construction/Operational	Short term	• The first 300 mm of soil must be stockpiled separate from the soil excavated deeper than 300 mm; and • All removed soil and material stockpiles must be protected from erosion, stored on flat areas where run-off will be minimised.	SANS 10103 ECA Noise Regulations NEMAQA Dust Regulations NWA	Throughout the project lifespan
Consultation	Planning Phase Installation of the pipeline	Medium term, local	• Stakeholder engagement will continue throughout the installation of pipeline to ensure the community and landowners are kept informed and allowed to raise issues; and • The Applicant shall attend applicable community meetings with the affected communities. Any issues raised will then be addressed through a grievance mechanism.	NEMA OHS and MHSA	Planning Phase
Monitoring	Post-Closure	All rehabilitated areas	• Re-vegetation of disturbed areas where required; • Provision must be made to monitor any unforeseen impact that may arise as a result of	MPRDA	Post-operation

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
			the proposed project such as leakages in the pipeline; • The financial provisions for the Harmony Welkom operations are to be updated during the annual review to include provisions for the pipeline; and • Even though leaks are unlikely and unplanned given the fact that the pipeline will be subject to best practice engineering, it is recommended that the pressure of the water within the pipes be monitored for potential leaks using an effective leak detection system. • Regular internal physical inspections of the pipeline must also be undertaken to detect any leakages.		

20.5 IMPACT MANAGEMENT ACTIONS AND OUTCOMES

Several activities impacts and management actions have been identified for the proposed project in order to minimise the impacts should the project receive authorisation. Table 18 provides a summary of the impact management actions and outcomes for the identified impacts.

Table 18: Summary of Impact Management Actions and Outcomes.

Activity	Potential Impact	Aspects Affected	Phase	Mitigation Type	Standard to be Achieved
Clearance of Vegetation	Deterioration and damage to existing access roads and tracks; Dust generation;	Topography; Soil; Air Quality;	Construction/ Operational	Avoid and control through implementation of EMP mitigation	NEMA NEMBA CARA

Activity	Potential Impact	Aspects Affected	Phase	Mitigation Type	Standard to be Achieved
	Invasion by alien species; Erosion; Impact on Fauna; Loss of fossil heritage; Indirect loss of wetlands; Loss of vegetation; Decrease in functionality; Water quality impairment; Altering hydromorphic soils; Drainage patterns change; and Altering overland flow characteristics	Surface Water; Transportation		measures (e.g., speed limit enforcement, vehicle maintenance)	Threatened or Protected Species (TOPS) regulations NEMAQA Dust regulations NWA DWAF best Practice Guidelines
Site access	Interference with existing land uses; Safety and security risks to landowners and lawful occupiers; Deterioration and damage to existing access roads and tracks; Dust generation;	Soil disturbance; Fauna; Flora; and Air Quality.	Construction/ Operational	Avoidance and control through preventative measures (e.g., communication with landowners, site access control) Remedy through application of mitigation measures in EMP	NEMA MPRDA NEMBA CARA Threatened or Protected. Species (TOPS) regulations NEMAQA Dust regulations

Activity	Potential Impact	Aspects Affected	Phase	Mitigation Type	Standard to be Achieved
					DWAF best Practice Guidelines
Waste management	Pollution of surface and groundwater resources from potential hydrocarbon spills	Soils; Surface and groundwater.	Construction/ Operational	Avoid through implementation of EMP mitigation measures (e.g., communication with landowners) Control through implementation of Environmental and Social Management System (ESMS)	DWAF Minimum requirements for waste disposal NEMWA NWA DWAF best Practice Guidelines
Installation of pipeline	Disturbance and Loss of fauna and flora; Wear and tear of existing roads; and Dust generation from excavation and increase site access.	Fauna and Flora; Access roads Air quality.	Construction/ Operational	Avoid and control through implementation of EMP mitigation measures (e.g., speed limit enforcement, vehicle maintenance, dust suppression)	NEMA NEMBA CARA Threatened or Protected. Species (TOPS) regulations NEMAQA Dust regulations NWA

Activity	Potential Impact	Aspects Affected	Phase	Mitigation Type	Standard to be Achieved
					DWAF best Practice Guidelines
Waste Management	Potential hydrocarbon spills that could cause pollution; Pollution of habitats and surrounding areas.	Pollution	Construction/ Operational	Avoid and control through implementation of EMP mitigation measures (e.g., speed limit enforcement, vehicle maintenance)	NEMA NEMBA NWA DWAF best Practice Guidelines
Rehabilitation	Erosion; Loss of habitat; and Disturbance to wildlife and communities in close vicinity	Topography Land use Soil disturbance Ecology	Construction/ Operational	Control through implementation of EMPr mitigation measures	MPRDA In accordance with Rehabilitation plan
Monitoring of rehabilitated sites	Erosion; and Disturbance to wildlife; and communities in close vicinity.	Topography Land use Soil disturbance Ecology	Construction/ Operational	Control through adhering to monitoring requirements	MPRDA and regulations

21 FINANCIAL PROVISION

On 20th November 2015, the Minister of the Department of Environmental Affairs (now referred to as the Department of Forestry, Fisheries and the Environment) promulgated the Financial Provisioning Regulations under the NEMA, which were meant to come into effect in 2021. However, these regulations have now been deferred to June 2022. The regulations aim to regulate and determine, the calculation of financial provision as contemplated in the NEMA, for the costs associated with the undertaking of management, rehabilitation, and remediation of environmental impacts from installation of the pipeline, mining, or production operations through the lifespan of such operations and latent or residual environmental impacts that may become known in the future. These regulations provide for, inter alia:

- Determination of financial provision: An applicant or holder of a right or permit must determine and make financial provision to guarantee the availability of sufficient funds to undertake rehabilitation and remediation of the adverse environmental impacts of installation of the pipeline, mining, or production operations, as contemplated in the Act and to the satisfaction of the Minister responsible for mineral resources.

- Scope of the financial provision: Rehabilitation and remediation; decommissioning and closure activities at the end of operations; and remediation and management of latent or residual impacts.

- Regulation 6: Method for determining financial provision – An applicant must determine the financial provision through a detailed itemisation of all activities and costs, calculated based on the actual costs of implementation of the measures required for:

    - Annual rehabilitation – annual rehabilitation plan

    - Final rehabilitation, decommission and closure at end of life of operations – rehabilitation, decommissioning and closure plan; and

    - Remediation of latent defects.

- Regulation 10: An applicant must-

    - Ensure that a determination is made of the financial provision and the plans contemplated in regulation 6 are submitted as part of the information submitted for consideration by the Minister responsible for mineral resources of an application for environmental authorisation, the associated environmental management programme and the associated right or permit in terms of the Mineral and Petroleum Resources Development Act, 2002; and

    - Provide proof of payment or arrangements to provide the financial provision prior to commencing with any installation of the pipeline, mining, or production operations.

- Regulation 11: Requires annual review, assessment, and adjustment of the financial provision. The review of the adequacy of the financial provision including the proof of payment must be independently audited (annually) and included in the audit of the EMPr as required by the EIA regulations.

- Appendix 4 of the Financial Provisioning Regulations provides the minimum content of a final rehabilitation, decommissioning and closure plan (FRDCP). No FRDCP has been compiled for an application for EA for the proposed installation of the reclamation pipeline. The Applicant has an obligation to determine applicable closure objectives, plan for rehabilitation and closure, and provide adequate financial provisions. The mine must ensure that their Financial Provisions Reports are updated annually and must where relevant, include provision for the decommissioning and rehabilitation of this pipeline.

21.1 DESCRIBE THE CLOSURE OBJECTIVES AND THE EXTENT TO WHICH THEY HAVE BEEN ALIGNED TO THE BASELINE ENVIRONMENT DESCRIBED UNDER THE REGULATION

No closure objectives have been identified as the project involves the installation of a proposed reclamation pipeline. It is, however, recommended in the EMPr that progressive rehabilitation be undertaken as the installation of the pipeline continues as well as any cleared areas will enable topsoil to be returned more rapidly, thus ensuring more recruitment from the existing seedbank.

21.2 CONFIRM SPECIFICALLY THAT THE ENVIRONMENTAL OBJECTIVES IN RELATION TO CLOSURE HAVE BEEN CONSULTED WITH LANDOWNER AND INTERESTED AND AFFECTED PARTIES

The Public Participation Process (PPP) is a requirement of several pieces of South African Legislation and aims to ensure that all relevant Interested and Affected Parties (I&AP's) are consulted, involved and their opinions are taken into account and a record included in the reports submitted to Authorities. The process ensures that all stakeholders are provided this opportunity as part of a transparent process which allows for a robust and comprehensive environmental study. The PPP for the installation of the proposed pipeline application needs to be managed sensitively and according to best practises in order to ensure and promote:

- Compliance with national legislation;
- Establish and manage relationships with key stakeholder groups; and
- Encourage involvement and participation in the environmental study and authorisation/ approval process.

As such, the purpose of the PPP and stakeholder engagement process is to:

- Introduce the proposed project;
- Explain the environmental authorisations required;
- Explain the environmental studies already completed and yet to be undertaken (where applicable);
- Determine and record issues, concerns, suggestions, and objections to the project;
- Provide opportunity for input and gathering of local knowledge;
- Establish and formalise lines of communication between the I&AP's and the project team;
- Identify all significant issues for the project; and
- Identify possible mitigation measures or environmental management plans to minimise and/or prevent negative environmental impacts and maximize and/or promote positive environmental impacts associated with the project.

Landowners and interested and affected parties have been consulted and provided an opportunity to comment on this Basic Assessment Report, EMPr and associated specialist reports.

22 MECHANISMS FOR MONITORING COMPLIANCE

Several activities, impacts and management actions have been identified for the proposed project in order to minimise the impacts. Table 19 below provides a summary of the compliance monitoring requirements to be undertaken should the project receive authorisation.

Table 19: Monitoring Requirements

Source Activity	Impacts Requiring Monitoring Programmes	Functional Requirements for Monitoring	Roles and Responsibilities	Monitoring and Reporting Frequency and Time Periods for Implementation
Installation of pipeline	All Impacts Identified in the EMPr.	Site Inspections and checklists.	Contractors full-time Environmental Representative.	Monthly inspections and checklists.
Clearance of Vegetation	Possession of permits for relocation of protected species (in any); Implementation of the recommendations of the specialist reports (See Appendix D); Implementation of the Alien Invasive Management Plan; and Implementation of the Rehabilitation Plan. Implementation of the EMPr	Document Control; Site Inspections and checklists; Report reviews; and Development of actions plans.	Contractors full-time Environmental Representative; and Monthly Independent ECO.	Monthly inspections, checklists, site visit and reporting.
Environmental Screening by ECO	All Impacts Identified in the EMPr.	Site Inspections and checklists	Monthly Independent ECO.	Monthly inspections and checklists
Ablutions - Chemical Toilets	All Impacts Identified in the EMPr.	Site Inspections and checklists	Contractors Environmental Representative	Weekly inspections and checklists

Source Activity	Impacts Requiring Monitoring Programmes	Functional Requirements for Monitoring	Roles and Responsibilities	Monitoring and Reporting Frequency and Time Periods for Implementation
Access Route **(Existing roads to be utilised)**	All Impacts Identified in the EMPr	Site Inspections and checklists	Contractors Environmental Representative	Weekly inspections and checklists
Temporary general waste storage **(General/domestic waste)**	All Impacts Identified in the EMPr	Site Inspections and checklists	Contractors Environmental Representative	Weekly inspections and checklists
Temporary hazardous waste storage **(Hazardous waste – Sealed Container)**	All Impacts Identified in the EMPr	Site Inspections and checklists	Contractors Environmental Representative	Weekly inspections and checklists

23 INDICATE THE FREQUENCY OF THE SUBMISSION OF THE PERFORMANCE ASSESSMENT/ ENVIRONMENTAL AUDIT REPORT

The result of environmental monitoring and compliance to the approved EMPr will be undertaken quarterly during construction and submitted to the DMRE in the form of an environmental compliance audit. Included in the report will be the following relevant information:

- The period when the environmental monitoring was conducted;
- The scope of the assessment;
- The procedures used for conducting the assessment;
- Interpreted information gained from monitoring the EMPr;
- Evaluation criteria used during the assessment; and
- Results of the assessment are to be discussed and mention must be made of any gaps in the EMPr and how it can be rectified.

Any emergency or unforeseen impacts will be reported immediately to the DMRE and other relevant government departments.

24 ENVIRONMENTAL AWARENESS PLAN AND TRAINING

Training and environmental awareness is an integral part of a complete EMPr. The overall aim of the training will be to ensure that all site staff are informed of their relevant requirements and obligations pertaining to the relevant authorisations, licences, permits and the approved EMPr and protection of the environment.

The applicant and contractor must ensure that all relevant employees are trained and capable of carrying out their duties in an environmentally responsible and compliant manner and are capable of complying with the relevant environmental requirements. To obtain buy-in from staff, individual employees need to be involved in:

- Identifying the relevant risks;
- Understanding the nature of risks;
- Devising risk controls; and
- Given incentive to implement the controls in terms of legal obligations.

The applicant shall ensure that adequate environmental training takes place. All employees shall have been given an induction presentation on environmental awareness. Where possible, the presentation needs to be conducted in the language of the employees. All training must be formally recorded, and attendance registers retained. The environmental training should, as a minimum, include the following:

- General background and definition to the environment;
- The importance of compliance with all environmental policies;
- The environmental impacts, actual or potential, of their work activities;
- Compliance with mitigation measures proposed for sensitive areas;
- The environmental benefits of improved personal performance;

- Their roles and responsibilities in achieving compliance with the environmental policy and procedures and with the requirement of the applicant's environmental management systems, including emergency preparedness and response requirements;
- The potential consequences (legal and/or other) of departure from specified operating procedures;
- The mitigation measures required to be implemented when carrying out their work activities;
- Discussions are required on sensitive environmental receptors within the project area to inform contractors and site staff of the presence of Red / Orange List species, their identification, conservation status and importance, biology, habitat requirements and management requirements of the Environmental Authorisation and within the EMPr; and
- All operational risks must be identified, and processes established to mitigate such risk, proactively. Thus, the applicant needs to inform the employees of any environmental risks that may result from their work, and how these risks must be dealt with in order to avoid pollution and/or degradation of the environment.

In the case of new staff (including contract labour) the contractor / applicant shall keep a signed register of attendance for proof and record of adequate environmental induction training.

24.1 MANNER IN WHICH EMPLOYEES WILL BE INFORMED OF ENVIRONMENTAL RISKS

Environmental awareness could be fostered by induction course for all personnel on site, before commencing site visits. Personnel should also be alerted to particular environmental concerns associated with their tasks for the area in which they are working. Courses must be given by suitably qualified personnel and in a language and medium understood by personnel. The environmental awareness training programme will include the following:

1. Occupational Health and Safety Training (OHS); and
2. Environmental Awareness Training EMPr management actions.

Environmental awareness training will focus on the following specific aspects and be undertaken in "Toolbox talk "topics prior to site access:

- Waste collection and disposal;
- Sensitive environmental receptors;
- Identification of Red/ Orange List species, conservation status and importance, biology, habitat requirements and management requirements of the environmental authorisation and EMPr; and
- EMPr management options and application.

24.2 MANNER IN WHICH RISKS WILL BE DEALT WITH TO AVOID POLLUTION OR DEGRADATION

The broad measures to control or remedy any causes of pollution or environmental degradation as a result of the proposed pipeline installation are provided below:

- Contain potential pollutants and contaminants (where possible) at source and ensure adequate bunding for hazardous substances;
- Handling of potential pollutants and contaminants (where possible) must be conducted in bunded areas and on impermeable substrates;
- Ensure the timeous clean-up of any spills;

- Implement a waste management system for all waste stream present on site;
- Investigate any I&AP claims of pollution or contamination as a result of mining activities; and
- Implement the impact management objectives, outcomes, and actions, as described in Section 20 above.

It is of critical importance that the broad measures to control or remedy any causes of pollution or environmental degradation are applied during the proposed pipeline installation.

25 SPECIFIC INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

No additional information was requested by the competent authority to date. This section will be updated at a later stage should any additional information be required.

26 UNDERTAKING

I, **Sikhumbuzo Mahlangu**, declare under oath –

- The correctness of the information provided in the reports;
- The inclusion of comments and inputs from stakeholders and I&AP's;
- The inclusion of inputs and recommendations from the specialist reports where relevant; and

That the information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties are correctly reflected herein.

Signature of the environmental assessment practitioner:

Name of company:

Environmental Impact Management Services (Pty) Ltd

Date:

Signature of the Commissioner of Oaths

Date:

The Applicant herewith confirms:

- The person whose name and identity number is stated below is the person authorised to act as representative of the Applicant in terms of the resolution submitted with the application; and
- The applicant undertakes to execute the Environmental Management Programme as proposed.

Signature of the applicant / Signature on behalf of the applicant:

Harmony Gold Mining Company Limited

Name of company (if applicable):

Identity Number of Applicant's Representative

Date:

27 REFERENCES

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